

# THE MARINE RECORD

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## SHIP MASTERS' ASSOCIATION.

MEETING OF THE GRAND LODGE.

Washington, Jan. 22.

The Grand Lodge of the Ship Masters' Association convened Tuesday at the Ebbitt House, Washington with a large attendance. Many beside the delegates from each lodge are present, most of them being accompanied by their wives. While a large amount of work is being accomplished, some time is still found for short excursions, to Mt. Vernon, and up and down the Potomac.

Among the most pleasant events of the proceedings thus far has been the presentation to Capt. Alex. Clark, for five years Grand President of the association, of a beautiful badge, (recently described in the RECORD) in acknowledgement of his eminent services to the organization, of which he was practically the founder. The presentation was made by Grand President C. E. Benham.

The first day's session was devoted chiefly to organization and routine business. A committee on resolutions was appointed, consisting of Capts. W. S. Mack, J. A. Holmes and C. M. Davis, which reported on Wednesday. In accordance with this report strong resolutions were adopted in opposition to any project to bridge Detroit River by placing piers in the river. Among the reasons mentioned for this opposition was the obstruction abutments would form against seeing up and down the river, the shadows they would cast at night, and the additional confusion that would result therefrom; also the tendency to gorge ice in the river during the spring and autumn. Representative Corliss, of Detroit, who has introduced a bridge bill differing slightly from that of Senator McMillan, was present at this session, and the resolutions reflected somewhat upon his action as not consistent with pledges he had previously made. Mr. Corliss was given the privilege of the floor, and said he had introduced the bill in the honest belief that such a bridge as was therein proposed would offer no obstruction to navigation. If it was demonstrated that this bridge would obstruct navigation he would remember his pledges and oppose it. Resolutions were also adopted pronouncing the Lake Shore bridge at Toledo an obstruction to navigation, and declaring in favor of a Sault patrol system.

The masters devoted a great part of Wednesday to making business calls, and have apparently accomplished much thereby. They called on Hon. Eugene T. Chamberlain, Commissioner of Navigation, and explained to him the reasons for their opposition to a bill introduced by Representative Payne of, New York, to change fog signals in the lakes from three to one blasts. They called at the Treasury Department to talk Sault patrol matters over with the revenue cutter service officials, and also called upon Commander Sigsbee, of the Hydrographic office, Chief Willis Moore, of the Weather Bureau. Secretary Lamont has made an appointment for Thursday to discuss river and harbor matters with the masters. Among other matters to be brought to his attention will be the necessity of securing immediate provision for beginning the work of widening the Hay Lake channel, several turns of which are to narrow to admit of vessels passing with any degree of safety. The masters think this should begin as soon as possible, as by the time it can be finished the lake commerce will have grown to such an extent as to utilize and absolutely require all the room that can then be furnished. Among the documents left for perusal by the Secretary of War was a communication from Capt. John Maurice, of Chicago, which appeared in the

MARINE RECORD on December 19, and which demonstrates in a most lucid manner, with mathematical calculations, the absolute necessity for immediately widening the channel at several points.

Among other visits paid was to the annual meeting of the M. E. B. A., at Willard's Hotel, and to the Grand Harbor of Masters and Pilots, at the Elks hall. Adjournment will probably not be reached before Friday or Saturday, and not many delegates may be expected home before next week. A committee will probably remain to appear before Congressional committees on the Detroit bridge, on the 30th inst.

## MARINE ENGINEERS' BENEFICIAL ASSOCIATION.

ANNUAL SESSION AT WASHINGTON.

WASHINGTON, Jan. 22.

The Marine Engineers' Beneficial Association of America is in its nineteenth annual session at Willard's Hotel. About 60 delegates from the various local organizations are present. This is the third annual meeting to be held in Washington, and is very important, as the order is urging the enactment of legislation which makes the engineer an officer of a ship in the legal sense as well as in practice, and thus prevents aliens from serving. It is desired by this legislation to set aside the interpretation by Secretary of the Treasury Chas. Foster of the Dingley law, when he refused to recognize engineers as officers.

The reports of the secretary and treasurer of the organization are most encouraging, showing a membership of 3,000, and an increase over last year of \$3,000 in the treasury surplus.

## GRAND HARBOR OF MASTERS AND PILOTS.

ANNUAL CONVENTION AT WASHINGTON.

WASHINGTON, Jan. 22.

The annual national convention of the American Association of Masters and Pilots of Steam Vessels assembled in the Elks' Hall, Washington, at 10 o'clock Tuesday morning. The attendance is very large. The order is well organized on both the Atlantic and Pacific coasts, and the larger rivers, with harbors at Chicago, Cleveland and Port Huron on the Great Lakes. The convention is acting in hearty co-operation with the Ship Masters' Association of the Great Lakes, and will spend most of this week in discussing matters pertaining to navigation.

## CHALLENGE FOR AN OPEN RACE.

Capt. Adolph Freitsch, who sailed from Milwaukee to Norway in his little sloop Nina, has returned to America. He has announced his intention to issue a challenge to sail across the Atlantic, from New York to the Irish Coast, against any crew of two men, he to go alone, asking for no advantage save that his boat shall measure ten feet more on the water line than that of his opponents. If the challenge is not accepted he will build a dory with a 30 foot water line, and schooner rigged, in which he will attempt to sail around the world. He is now lecturing on his experiences during his Atlantic voyage and his late shipwreck, when he lost the Nina.

The Hydrographic Office chart of Lake Michigan, includes the Straits, St. Mary's river, the greater part of the south shore of Lake Superior, all of Saginaw Bay, and all the west shore of Lake Huron north of Saginaw Bay. The usual information concerning the latest soundings, compass variations, etc., appears. The price of this chart is 75c.

## COAL OUTLOOK AT CHICAGO.

The Western soft-coal trade has not experienced the violent crises which characterized it in 1894. Here and there strikes and lockouts occurred, but they were only of a local nature. The Pittsburgh region was the storm-centre for Ohio, Indiana and Illinois, and after numerous conferences an arrangement was brought about between the thick and thin vein operators and their miners based on the 64-cent scale, with a resultant 59-cent rate in Ohio and Illinois for a differential. The supply of soft coal at Chicago was, therefore, pretty good, and it is interesting to note that the receipts of bituminous coal reached the figure 4,783,000 tons, as against 3,730,000 tons in 1894, an increase of 1,500,000 tons of coal, which figure, however, is still about 125,000 tons below that of 1893. Of this amount, in 1895, 3,880,000 was consumed in the city, as against 3,340,000 tons in 1894, and 4,380,000 in 1893. The fact of the matter was that the low price of anthracite resulted in a quantity of soft-coal being displaced by the utilization of hard coal in its stead.

On the other hand shipments of soft coal to the country were some 900,000 tons in 1895, as against 390,000 in 1894, and 526,000 tons in 1893, an increase over the shipments of last year of over 500,000 tons, and nearly 400,000 tons over those of 1893. Chicago, therefore, as a soft coal distributing point is rapidly advancing, having practically recovered its lost ground and increased its outside territory.

Without indulging in any speculation, it seems pretty evident, especially in view of the general revival of trade, that some 5,000,000 tons will reach this market during the present year. The soft coal figures above touched upon are interesting from many points of view, as showing the fluctuations of the various grades of coal at this point, which is mostly attributable to the actions of the railroads in their manipulation of tariffs. Many grades of soft coal were sold in the city at a phenomenally low figure, which was as injurious to the operators as to the roads. With the advent of summer, which made its appearance earlier than usual, there was a scramble to get rid of coal and prices went still lower.

Matters reached such a stage that it became evident that something had to be done to save the business, and combinations of operators were formed, and by this time the railroads also got tired, and steadied rates by the end of the summer. Orders again became plentiful, and the business began to boom up. As usual, under circumstances of this nature, when the mines were running full, the car-service became tangled up and there was an actual shortage of miners. This was all the more annoying as the agricultural element throughout the West and Northwestern States were returning to burning coal for fuel instead of wood and all kinds of farm refuse which was made use of so extensively the year before.

Receipts of the various soft coals at Chicago show that Pennsylvania shipped 182,000 tons, which is below that of last year, while Ohio is credited with 350,000 tons, as against 468,000 tons in 1894. All the other States show an increase, and West Virginia and Kentucky fuels totaled up 339,000 tons in 1895, as against 296,000 tons in 1894; 215,000 tons in 1893, which is an increase. The receipts of Illinois in 1895 were 2,401,000, as against 1,501,000 in 1894, and 1,900,000 tons in 1893, an increase over those of last year of the enormous figure of 900,000 tons. Indiana also makes a very creditable showing having shipped to the city 1,509,000 tons in 1895, as against 1,165,000 tons in 1894, an increase of 344,000 tons over last year.—Black Diamond.

## LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interest of Lake Carriers, and improve the character of the service rendered to the public.

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## TRADE NOTES.

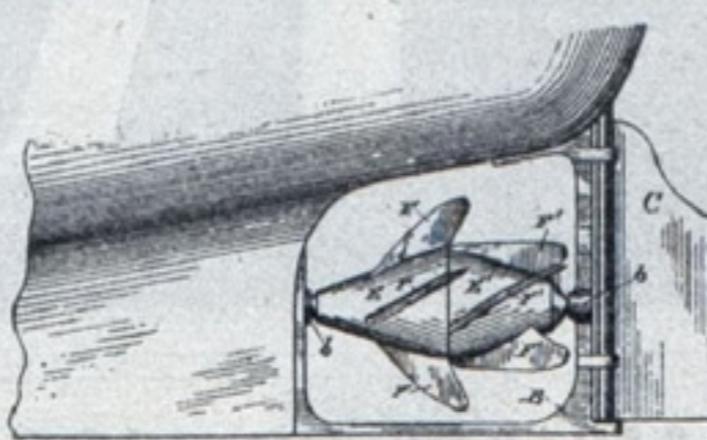
THE Hine & Robertson Co., of 68 Cortlandt St., New York, are issuing a neat and comprehensive catalogue of their steam indicators, planimeter, reducing wheel, steam cocks of various patterns, etc. The catalogue contains much that will interest steam users, and a copy will be sent to any engineer addressing the firm as above.

Capt. George L. Lyon, of the Egg Rock Life-Saving Station, off Nahant, Mass., writes THE RECORD that he is building a yacht which he expects to have ready for service by April 1. He will put in a compound engine, built by Mason, of Boston, measuring 4½ and 9 by 6 inches, with hollow piston valves, and all late improvements.

The Almy Water Tube Boiler Company, of Providence, are building two boilers to furnish 600-horse power for the Bath Iron Works, Bath, Me., to go into a steam yacht now being built by them for a Boston yachtsman; also, one boiler for a fishing steamer at Noank, Conn., 100-horse power; also, one 250-horse power boiler for Mr. C. A. Tatum, of New York City, for his steam yacht Cassette. The trial of the two boilers recently shipped to Leith, Scotland, by this company, took place December 11, and the test was a pronounced success, the boilers giving 33 per cent more power than was asked for.

## NEW INVENTIONS.

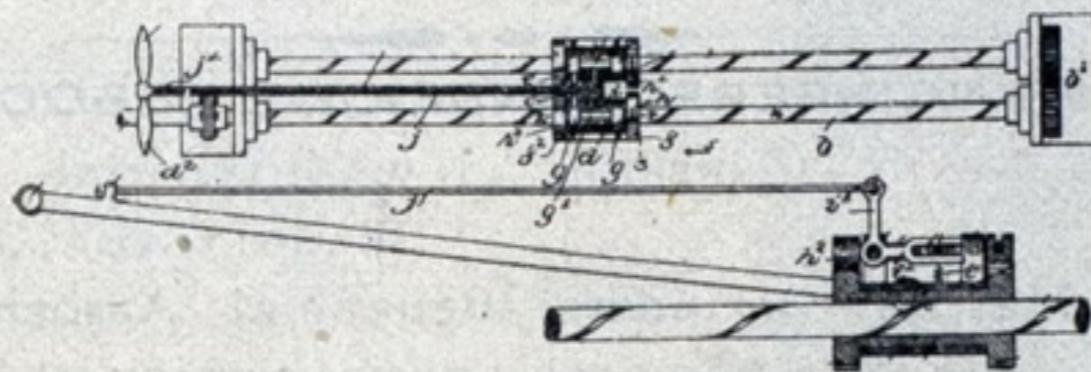
The Great Lakes were well represented during the past week in the list of patents issued for maritime and relative purposes. One of these is Mr. Albert Viert, Chicago, who was granted letters patent on a "Propeller for Vessels" (No. 552,938) for which he made application May 18, 1895. It consists of the combination of two cone-shaped pieces or mantles having screw-threaded portions at their bases to unite them, and provided with dove-tail grooves extending from their bases toward their apices, with a series of blades fitted in these grooves and held in position by the mantles.



The combination of a hollow oval-shaped D, with hollow cone-shaped pieces E and E' provided with screw-threaded portions E and E' at their bases and dove-tail grooves E' on their outer surfaces, a series of blades having shoulders filled in these grooves.

552,910. Boat Propelling Apparatus. Charles M. Kimball, Toledo, O. Filed April 9, 1895.

The claim is for a boat propelling apparatus comprising parallel screw-shafts, gears connecting the same, a cross-head embracing said screw-shafts, and having a handle bar by which to reciprocate it, sleeves journaled



in the cross-head and having feathers engaging the channels of the screws, reversely set rachets on jaw sleeves, double pawls for engaging said rachets, and means for reversing the pawls.

553,141. Oar Lock. Andrew Smith, Traverse City, Mich. Filed October 24, 1895.

The claim is for the combination of an oar-lock, backwardly depressible spring-held locking pins normally projecting into the lock, an oar carrying a circumferential groove adapted to be engaged by the said pins, and a mechanism for automatically disengaging the pins from said groove. The oar is fitted with oppositely inclined shoulders arranged in diametrically opposite sides of said groove, so that when the oar is rotated they are adapted to push back the pins and release the oar. A stop for adjustment is also connected.

553,177. Propeller Wheel. George W. Peiton, Muscatine, Ia. Filed October 18, 1895.

This is for the combination of a series of shafts extending between the arms of a feathering blade propeller, and provided with end and middle cranks, eccentrically disposed rings connecting the end cranks in series, an intermediate ring eccentrically regulated and operatively connected with the blades or buckets and with the intermediate cranks, and controlled in its movements thereby; and rollers disposed to control the movements of the end eccentric rings.

553,131. Propeller for Navigable Vessels. Giovanni C. Parini, Liverpool, Eng. Filed June 4, 1894. Patented in England.

This screw propeller consists of a boss and number of blades, each of which, adjacent to said boss, is formed with a triangular section standing at one angle of pitch with respect to the axis of said boss, the outer face of the remaining part of each of said plates standing at a greater angle of pitch with respect to this boss.

553,150. Hydraulic Steering Gear. Charles E. Bergman, Everett, Wash. Filed April 22, 1895.

The claim is for the combination with a rudder shaft or spindle, of a quadrant cylinder, swiveled concentric with such spindle, a piston operating in the cylinder and positively secured to the rudder shaft or spindle, resili-

ent devices for maintaining the cylinder in its normal position and adapted to yield when the rudder shaft or spindle is turned torsionally, and means for varying the pressure upon opposite sides of the plane of the piston to communicate motion to the rudder shaft.

## COMMERCE OF SUPERIOR.

Secretary J. J. Atkinson of the Superior Board of Trade, has made public the following figures relating to the commerce of the port of Superior for the navigation season of 1895:

Grain shipments by lake were: Wheat, 20,901,832 bushels; barley, 1,609,378; flax, 1,300,204; oats, 421,543; rye, 1,290. On Dec. 28 there was in store in elevators, wheat, 6,135,328 bushels; barley, 105,042; flax, 1,103,885; oats, 110,035; corn, 1,400. The amount of flour manufactured at Superior was 2,305,267 barrels in 1895, as compared with 2,028,121 in 1894. The total shipments of grain in 1895 were 23,234,256 bushels, as compared with 15,292,123 bushels in 1894. Superior has grown in ten years to be the second largest primary wheat market in the United States.

The report of Deputy Collector R. J. Shields, of the port of Superior, states that the receipts and shipments of freight for the season of 1895 amount to 3,362,060 tons, valued at \$64,958,054, as compared with 2,596,514 tons, valued at \$42,516,712 in 1894, and 15,730 tons, valued at \$115,105, in 1883. Superior's trade formed it is claimed, nearly 25 per cent of the Sault canal traffic last season.

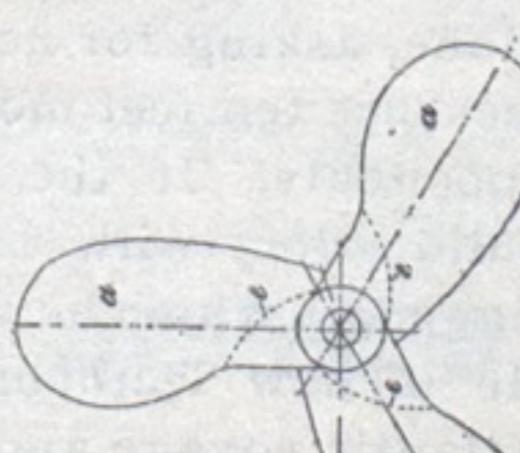
The total number of arrivals and clearances at Superior in 1895 was 2,738 vessels with a tonnage of 3,666,374 in the coastwise, and 154 vessels, with a tonnage of 142,690 in the foreign trade. The receipts were: Coal, 1,188,587 tons; merchandise, 242,823 packages, 13,951 tons; manufactured iron, 16,603 tons; salt, 83,371 barrels; sugar, 20,300 barrels, and 22,895 bags; lime, 6,100 barrels; cement, 21,880 barrels; staves, 748,000; steel rails, 10,093; oil 109,396 barrels. Shipments—Flour, 3,559,826 barrels and 53,377 sacks; wheat, 18,466,830 bushels; other grains, 1,640,400 bushels; copper, 38,170 tons; iron ore, 134,107 gross tons; lumber, 9,822,000 feet; shingles, 52,739,000; wool, 4,244 tons; bran, 21,605 sacks; feed, 16,250 sacks; merchandise, 7,199 packages and 2,776 tons; canned salmon, 62,357 cans. The value of the foreign transit trade was \$255,014 east bound, and \$223,310 west bound. The season for Superior opened April 22 and closed Dec. 14—236 days.

## TWO MORE FOR THE LAKES.

The Treasury Department will evidently do all in its power to secure the passage of Senator Cullom's bill providing for an appropriation of \$400,000 with which to build two revenue cutters for the lakes in addition to the one now under construction in Cleveland. In a letter to Senator Cullom, Mr. C. S. Hamlin, the assistant secretary, says:

"It is the opinion of this department that at least two revenue cutters, additional to the one now being constructed at Cleveland, should be provided for service on the great lakes. In view of the large advance in the price of material entering into the construction of iron and steel vessels, the sum of \$400,000 will not be too great for two vessels of the class required for service on the lakes. Your suggestion that several good vessels should be provided for the lake service is in perfect accord with the views of this department. I beg to say further, in reply to the closing inquiry of your letter, that at least two additional revenue cutters should be constructed for service on the Pacific coast. The vessels now there are all very old and of obsolete type of construction—some wooden, some iron, all of them too small and too slow and of too small power to properly meet the service required of them. Vessels required for service on the Pacific coast should be of size, general dimensions and capacity to enable them to take and keep the sea under all conditions, with a cruising radius of not less than 2,500 miles."

Detroit seems to stand a chance of securing one of the new branch hydrographic offices.



MARINE RECORD Life Savers' Series.

CAPT. J H. FRAHM.

THE RECORD can tell few of its lake readers anything new that will add to the dread all of them have of the bleak south shore of Lake Superior, especially that portion between Marquette and Whitefish Point, which is agreed by all the most inhospitable part of the American lake coast. That the government is fully cognizant of this is shown by the establishment, along that shore between the points named, of five stations in charge of most capable, active and experienced men. One of these is the Muskallonge Lake station, better known on the lakes as the Deer Park station, although this is to some extent misleading, as the same postoffice is used for two other stations on this rocky shore, where so many fine ships have been lost. Capt. J. H. Frahm is particularly well known to the marine public, as it was through his interest, activity and intelligence that the press was so well furnished with information regarding the lamentable wreck of the steel steamship Western Reserve, which foundered off this shore, and whose passengers and crew with one exception, were overwhelmed by the heavy sea and the breakers on the treacherous reef in that locality. The disaster it was beyond the power of Capt. Frahm or his men to prevent or even foresee; but they gave succor to the sole survivor, and through their unremitting diligence the bodies of nearly all were recovered and identified.

Capt. Frahm was born in Holstein, Germany, on the North Sea, on April 1, 1855. He began before he was six years old to attend school, and continued there until the age of sixteen, receiving a very fair education. During the last six years of this period he was compelled to give up school during the summer months, working on a farm, and afterwards in a shipyard, doing some sailing and coasting on the North Sea.

When seventeen years of age, young Frahm left home in search of a brother, who was then sailing from Rotterdam to the East Indies. He accordingly shipped on board a Hollands-packet bound for Batavia, East India. On his arrival at his destination he found that his brother was on the coast of China. He then sailed for several years out of Liverpool, and later came to New York, shipping on board "Yankee packets," until 1880. That spring he shaped his course for the Great Lakes. During his time at sea Capt. Frahm sailed in vessels of various nationalities, and learned many languages. He roamed the Atlantic, Pacific, Indian, and Antarctic oceans. Once he was shipwrecked, floating for eighteen days on a water-logged hulk, lumber-laden and dismasted. The sea swept almost everything overboard, and all hands remained lashed on the poop deck, in the winter season, and in a high northern latitude. "We had nothing," states Capt. Frahm, "but hard tack, soaked with sea water, a little raw pork, a small quantity of gin, and brackish drinking water upon which to subsist. But life is sweet and seems more so in time of peril; we were rescued and our hazards forgotten, but not without a prayer of thanks first to Him who doeth all things well."

Capt. Frahm arrived at Cleveland in the spring of 1880. "For once in my life," he says, "I found myself without a berth. The city was full of union lake sailors, and as they styled me an 'old salt,' they had no use for me at all. It was at this time that the crew of Point aux Barques station on Lake Huron met with their terrible disaster. I took at once passage for Detroit and upon making application to enlist on the Life-Saving service was ordered by Capt. Sawyer, the superintendent of the Tenth district, to proceed to Point aux Barques and to report to Capt. (now Superintendent) Kiah for duty."

Since that time Capt. Frahm has given his attention and energies exclusively to this service. He served as surfman four years at Point aux Barques, and then one year at Ottawa station, after which he was transferred to the Muskallonge Lake station. In 1887, he was promoted to the rank of keeper, and placed in charge of Two Heart River station, and in 1891 he was given charge of the station at Muskallonge Lake. "I am proud," he says, "of being still an honored member of the United States Life Saving Service—the best on the globe."

Capt. Frahm's search for his brother, mentioned above, was never crowned with success. "I was informed from my old home in Holstein that my brother was last seen in Singapore, and was connected with a

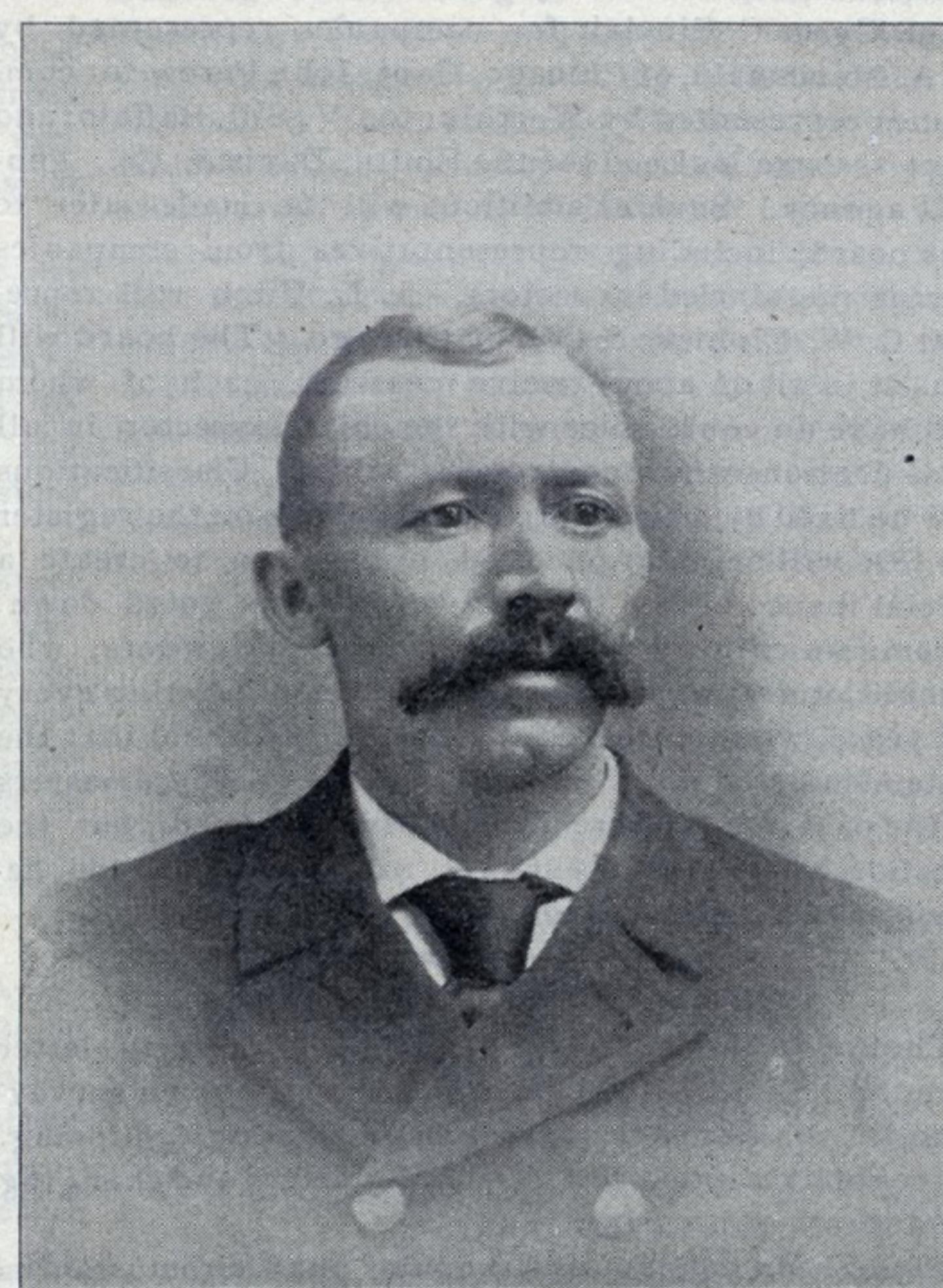
Chinese coasting company. I again saw in a Detroit paper dated Oct. 16, 1890, that the vessel Musaln Marn foundered during a gale September 15, together with Capt. Frahm and 50 men, about 250 miles from Yokohama, together with the Turkish frigate Ertougoul. I, therefore, have reason to believe that Capt. Frahm, of that China coaster, was my brother."

ELECTRICITY ON THE ERIE CANAL.

There has just been issued an important supplemental report to the annual report of the New York Superintendent of Public Works. It is written by Charles R. Barnes, electrician, of Rochester, and treats of the proposed introduction of electricity upon the canals. Commenting upon the report, the Superintendent says:

"I am very sanguine that electrical canal-boat propulsion is not only possible, but also that the devices which have been already tested and are being constantly improved, will result in a perfect system within the time required for the general improvement of the canals now inaugurated. The test seems to be satisfactory, and to indicate that as soon as the details of the system are so worked out as to meet every contingency of canal-boat traction, it will become a cheap and favorable one with boat owners and forwarders, and that the cost of traction will be largely reduced and the speed greatly increased."

"Summing up," Mr. Barnes says, "the electric towing



CAPT. J. H. FRAHM.

system appears to present so many meritorious features that I have no hesitation in endorsing it as the system deserving preference over any other hitherto experimented upon."

IN ORDINARY AT OGDENSBURG.

Collector of Customs George E. Van Kennen, for the port of Ogdensburg, kindly furnishes the following list of vessels in winter quarters at Ogdensburg:

STEAMERS—Wm. Armstrong, Curlew, Hecla, Walter Vail, Island Belle, H. R. Southgate, Resolute, Dorothy, F. H. Prince, Jas. R. Langdon, Wm. A. Haskell, Wm. L. Proctor, Thos. Wilson, Stranger, Lotus, G. D. Seymour, Myra, Rescue, Pandora.

SCHOONERS—Jennie Matthews, Isaac Stephenson, Henry Witbeck, Fred Carney, Baltic, Walter A. Sherman, E. P. Beals, Mary Lyon, Chas C. Buell, George G. Houghton.

BARGES—Onondaga, Argosy, Black Diamond, England, Ireland, Aid, Kent, Menominee, Jas. Buckley, H. B., Hoboken, Scotland, Argo, Bolivia, Mohawk.

MAY START A SMALL SHIPYARD.

Mr. David Lumgair, of West Bay City, Mich., contemplates starting a well equipped shipyard for small steel vessels in connection with his engine construction. He is in the market to build anything of this sort up to 175 feet, and will establish the yard at once should he secure certain orders now pending.

SOUTH CHICAGO'S BUSINESS.

Harbor Master Walter McCall favors the RECORD with the statement given below of the commerce for 1895 of the Calumet river. This is the landing place of the new car ferry barges operating between Peshtigo and Chicago, two of which were in commission last summer, carrying twenty-six cars each. The number next summer will be reduced to four. There are now located there eight elevators, one with a capacity of 1,000,000 bushels, one of 900,000, three of 800,000 each, one of 750,000, one of 700,000 and one of 300,000, a total of over six million bushels, besides which storage is now afforded by seventy-five vessels in winter quarters there. One of these elevators of 800,000 capacity is now in course of erection by the Lehigh Valley Co. The Reading Railway Co. has just completed a large coal dock here, and the ore handling capacity is being increased. One of the greatest needs of the Calumet, which in a few years will handle the greater part of Chicago's lake commerce, is a breakwater for the assistance of vessels in getting in and out in wild weather. Mr. McCall's figures follow:

Entered—steamers, 1187; schooners, 539; total, 1726. Cleared,—steamers, 1195; schooners, 557; total, 1752; grand total 3478.

COMMODITIES RECEIVED.

1,820,792 tons iron ore	38,327,324 feet lumber
1,880 tons of pig iron	16,135,500 shingles
1,660 tons steel wire	8,449,800 lath
725 tons steel plate	41,225 pickets
700 tons steel	17,702 railroad ties
415 tons railroad iron	10,900 posts
100 tons steel rails	3,500 packages barrel staves
40 packages wire	2,500 packages barrel heads
15 cars old rails	900 cords wood
4,637 packages merchandise	179 cords sawdust
42 tons merchandise	175 cords slabs
3,200 bushels potatoes	501 cars lumber
2,040 bushels apples	51 cars telegraph poles
1,000 barrels cement	10 cars slabs
1,030 bags cement	10 cars lath
200 barrels sugar	2 cars bark
800 empty barrels	240,866 barrels salt
98 cars wheat	400 barrels plaster
4 cars paper	170,000 tons hard coal
10 car silks	87,156 tons salt
1 wrecking outfit	10,667 tons rock plaster
2 Scotch boilers	32 cars flaxseed

COMMODITIES SHIPPED.

8,782,440 bushels corn	4,407 sacks feed
0,659,540 bushels oats	1,500 sacks flour
4,154,775 bushels barley	2,000 sacks starch
814,569 bushels wheat	865 barrels flour
18,289 bushels rye	500 sacks millstuff
128,294 barrels oil, in bulk	371 empty cars
29,200 barrels wax	298 cars coal
26,485 tons steel billets	35 cars rails
20,058 tons steel rails	3 cars pig iron
1,200 tons steel	5 cars railroad iron
9,800 tons of railroad iron	1 car spikes
1,000 tons barb wire	1 car steel
840 tons scrap iron	1 car's itch stands
400 tons nails	1 car coke
100 tons angle bars	34 cars glucose
50 tons fittings	2 cars sugar meal
69 tons merchandise	1 car corn
482 packages merchandise	8 cars glass
42 packages machinery	1 car meat
8 kegs spikes	2 cars wool

282,830 bushels grain transferred.

WALTER MC CALL, Harbor Master, S. Chicago.

VISIBLE SUPPLY OF GRAIN.

As compiled for THE MARINE RECORD by George F. Stone, Secretary Chicago Board of Trade, January 18, 1896.

CITIES WHERE STORED.	WHEAT. Bushels.	CORN. Bushels.	OATS. Bushels.	RYE. Bushels.	BARLEY. Bushels.
Albany .....	.....	140,000	260,000	.....	55,000
Baltimore .....	261,000	1,103,000	137,000	108,000	.....
Boston .....	1,225,000	320,000	12,000	.....	.....
Buffalo .....	2,834,000	108,000	29,000	460,000	1,738,000
" afloat .....	259,000	.....	223,000	.....	304,000
Chicago .....	20,967,000	2,328,000	601,000	246,000	23,000
" afloat .....	.....	1,216,000	227,000	.....	.....
Cincinnati .....	49,000	6,000	31,000	34,000	140,000
Detroit .....	342,000	20,000	16,000	12,000	5,000
Duluth and Superior .....	9,021,000	40,000	685,000	1,8,000	151,000
" afloat .....	512,000	.....	.....	.....	.....
Indianapolis .....	93,000	61,000	.....	.....	.....
Kansas City .....	1,539,000	5,000	63,000	29,000	.....
Milwaukee .....	437,000	.....	1,000	185,000	36,000
" afloat .....	176,000	.....	120,000	.....	.....
Minneapolis .....	19,587,000	126,000	831,000	159,000	194,000
Montreal .....	256,000	7,000	183,000	3,000	39,000
New York .....	6,635,000	849,000	1,658,000	23,000	248,000
" afloat .....	864,000	33,000	277,000	.....	298,000
Oswego .....	14,000	24,000	.....	.....	146,000
Peoria .....	36,000	454,000	268,000	1,000	.....
Philadelphia .....	515,000	379,000	183,000	.....	.....
St. Louis .....	1,495,000	233,000	585,000	12,000	13,000
" afloat .....	.....	.....	.....	.....	.....
Toledo .....	845,000	253,000	181,000	124,000	.....
Toronto .....	26,000	.....	63,000	.....	36,000
On Canal .....	.....	8,000	12,000	.....	.....
On Lakes .....	.....	.....	.....	.....	.....
On Mississippi .....	.....	.....	.....	.....	.....
Grand Total .....	67,988,000	7,713,000	6,616,000	1,554,000	3,426,000
Corresponding date 1895 .....	85,586,000	12,278,000	8,424,000	448,000	2,316,000

THE MARINE RECORD is the repository for all engineering and nautical publications. Hydrographic charts always on hand.



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CLEVELAND, O., JANUARY 23, 1896.

A RESOLUTION has passed the House asking the Secretary of the Treasury to inform that body whether steam vessels carry enough life-boats to accommodate passengers and crew in case of disaster. This was directed at ocean steamers, but is not so worded, and will probably result in a rigid inspection every where.

CONGRESS is taking up with great enthusiasm the question of raising lake levels by dams, jetties, locks and other works. The general approval given by the engineer corps to this method adds to the popular confidence in it. Such works would be comparatively inexpensive, as compared with the great amount of dredging which would then be unnecessary; they would be rapidly constructed, and their effect would be almost immediate. Congressmen Burton, Towne, and other lake Representatives on the River and Harbor Committee are doing good and effective work. Let it go on.

A MOVEMENT is well under way on the lines suggested in the RECORD some time ago, when it was argued that in connection with the \$9,000,000 State appropriation for the Erie canal improvement, the United States Government should appropriate sufficient money to still further deepen the channel so as to permit the passage from the ocean to the lakes of torpedo boats and light draft gun boats. A bill to this effect has already been drawn up in Washington, carrying with it a \$2,000,000 appropriation, which would not only be wise as a war measure, but would at once come back to the people in time of peace in the increased commercial facilities and lower freights afforded by a deeper channel.

IT has been hinted that the resolution offered by Capt. W. S. Mack at the Lake Carriers' annual meeting might result in the latter receiving a snub when they open correspondence to secure action by the Dominion Government in connection with obstructions to navigation near Pointe Au Pelee and in Detroit River. This is taking a very narrow view of our Canadian neighbors. The proposition to tender Lake Carriers' vessels to the government in the event of war was provoked by the Toronto vessel masters, who had taken similar action. The resolution was offered in a jocular manner by Captain Mack and was so received by the members. Of course this merriment was due to the unlikelihood of hostilities breaking out, and the resolution was intended as entirely sincere should need arise; but loyal Canadians will appreciate loyalty in Americans. The movement on either side might be called by the cynics "making a virtue of necessity," as either government would help itself to such vessels as it required. Nevertheless the movement on both sides of the lakes was inspired by loyalty and patriotism and need be productive of no ill feeling.

## OBSOLETE AND UNJUST.

The law which a master of an American vessel, either steam or sail, is precluded from libeling the vessel for his wages, is one which should be removed from the statutes. At a time when the master had the handling of all moneys and transacted all the business of the vessel, such a law was in good standing. But in the present day of purasers and ship's agents and brokers, the master is no longer the custodian of the ship's funds and therefore should have as equal a chance to recover his wages as the rest of the crew.—Maritime Register.

A case was decided only last summer in connection with a libeled Lake Michigan vessel, in which the law compelled the court to deal unjustly in just such an instance. The matter cannot be given too prompt attention.

## INLAND LLOYDS ANNUAL MEETING.

The annual meeting of the Inland Lloyds' Association of Lake Underwriters occurred at Detroit last Thursday and Friday. J. J. Clark of Detroit, was chosen president; J. S. Gasden of Chicago, vice-president, and A. H. McDonnell, of Detroit, secretary. The executive committee comprises David Vance of Milwaukee, George L. McCurdy, J. S. Gasden and C. A. Macdonald of Chicago, and Henry S. Sill of Buffalo. Capt. Daniel McLeod was retained as inspector. A movement to give the inspectorship to Capt. A. R. Manning, of Cleveland was defeated. The inspection board this year will consist of gentlemen representing the various insurance companies as follows: Capt. C. M. Davis for companies represented by David Vance, of Milwaukee; Capt. Cyrus C. Sinclair for companies represented by C. A. Macdonald, of Chicago, Capt. John Perew for companies represented by Worthington V. Sill, Buffalo; and Capt. George McLeod for the Smith, Davis & Co., general agency. Several additions will be made later to this board, including representatives from companies having no salaried inspectors. A. L. Fitch will represent C. W. Elphicke & Co., of Chicago. The board will consist in all of about twelve members, each of whom will have an equal voice with the chief inspector in all classifications where controversy arises. Classifications will be fixed by a two-thirds vote. Work on the register for 1896 will begin at once. A proposition to create a special inspectorship for steel vessels was voted down. A communication signed by a number of owners, who entered protest against lowering a vessel's rating every ten years, was considered; but it was not found that the system could be improved in this respect. The disasters of the past season were informally discussed, but the question of rates and changes in policies will be decided upon at a later meeting.

## VIEWS FROM OVER THE SEA.

The RECORD is in receipt of a very interesting letter from Mr. Samuel I. P. Thearle, the well-known surveyor to Lloyds Register of British and Foreign Shipping. After referring to a few personal matters and changing the address of his paper, he says:

I have been hoping and hoping that circumstances would lead to my making a visit to your very busy and go-ahead city. I read the paper with the greatest possible interest, and every time I take it up I am reminded as I read it of people and places I saw when in America, and of interesting incidents that occurred at the time. My memories of the Great Lakes and more especially of Cleveland, Detroit, Saginaw Bay City, Duluth, Chicago, and Milwaukee, are of the pleasantest kind, and I cherish a loving regard toward the many kind friends I met there.

I presume the message of President Cleveland to Congress is not going to destroy private friendships, and I should hope it will not destroy anything but mistakes and misunderstandings, and these are always better out of the way.

I am watching the progress of the deep waterway movement, and am curious to know what the lake ship-builders think of a deep channel connection with the seaboard. So far as I can take in the situation it seems to me they are far better off as they are, competing only among themselves, than they would be with the wide competition the deep waterways would open up. Of course the Western farmers' interests are all the other way.

If not too late permit me to wish your paper and yourselves a very happy New Year. Very truly yours,

S. I. P. THEARLE,

Glasgow, 9th January, 1896.

There is a movement on foot to form a harbor at Rocky River, with extensive docks, etc. It would be hard to get a government appropriation, for some time, owing to the shallow depth of the river there, and the absence of commerce for it to serve. More needy harbors will be looked after before new ones are created.

## MILWAUKEE'S LAKE COMMERCE.

Mr. James F. Trowell presents a neat little pamphlet relating to Milwaukee's commerce for last year. During 1895 there were 5,485 arrivals, with a total tonnage of 3,529,919, and 5,408 departures, the total tonnage being 3,715,315.

The receipts of lumber, etc., by lake were as follows: Lumber, feet, 145,609,000; shingles, 5,827,000; lath, feet, 6,355,000; posts, 383,730; ties, 20,350; bark, cords, 36,923; wood, cords, 78,554. Coal receipts were:

Anthracite.	Bituminous.	Total.
1895.....	852,078	483,864
1894.....	783,818	453,141

Salt receipts from Manistee were 338,707; Ludington, 173,133; Buffalo, 49,870; Cleveland, 9,645; total 571,355.

Flour receipts were 2,578,070 barrels, and shipments, 3,279,645 barrels. The grain movement up to Dec. 21, was as follows:

Receipts,	Shipments,	In elevators,
Rail and lake.	Rail and lake.	Dec. 21, '95.
Wheat.....	9,406,179	2,686,255
Corn.....	1,213,550	64,290
Oats.....	8,680,075	7,764,903
Barley.....	10,013,872	4,380,744
Rye.....	1,035,861	425,719
Grain in irregular elevators.....		800,000

There are in winter quarters at Milwaukee 53 steamers and 66 schooners and barges, besides harbor and fishing tugs and scows. Included in the list are the steamers Thomas Cranage, City of Venice, Elfin-Mere, and schooner Scotia, which will get over to Chicago during the first six weeks of 1896. The City of Paris, W. H. Gilbert and Twin Sisters are loaded with grain. Beside this fleet in ordinary there are four lines of steamers in active commission during the winter—the F. & P. M. line, with five steamers; the D. G. H. & M. line to Grand Haven with one steamer; the Vandalia line, two steamers; Goodrich line, four steamers; Huron line, two steamers on the west shore, between Chicago, Racine, Milwaukee, Sheboygan, Manitowoc, Keweenaw and Ahnapee.

Dredging in Milwaukee harbor was done as follows: Milwaukee River, 86,824.6 cubic yards; Menominee River, 50,027; Kinnickinnic River, 15,885.1; total, 152,736.1.

## A PROGRESSIVE CHIEF.

General Craighill, Chief of Engineers of the War Department, is a broad man and a true friend to the commerce of the Great Lakes. He has sent to the House Committee on Rivers and Harbors a strong expression in favor of investigation of the falling levels of the Great Lakes. This is contained in his report on the Griswold bill, practically the same as the bill introduced by Senator Brice and published last week. In his communication General Craighill says that the question is the most important and momentous that now arises for the consideration of Congress and the department in connection with navigation interests. He suggests the possibility of checking the subsidence of the waters of the lakes by the construction of wing dams in the St. Clair and Detroit Rivers in order to hold the waters in the upper lakes, and also to place similar dams at the entrance of the Niagara River to raise the waters of Lake Erie. It has been shown to the satisfaction of the sub-committee of the committee on rivers and harbors, which made the report recently published in favor of the Griswold bill, that a raising of the levels of the lakes three feet would make a difference of 30 per cent in the possible increase in carriage by the vessels of the lakes, and what the cost of the proposed wing dams would be much less than the cost of dredging in the harbors where navigation has been impaired.

## STURGEON BAY CANAL.

The approximate value of the shipping which sought refuge at the head of Sturgeon Bay during the season of '94, and which came in via the ship canal was \$2,353,350. The value of the cargoes which these vessels had on board was \$398,831 in round numbers. These figures were obtained from the official report of the engineer in charge. The latter has recommended an appropriation of \$78,450 for the canal for the fiscal year ending June 30, 1897. The total amount appropriated by the government since work began on the harbor piers in 1872 is \$178,182.50, this being exclusive of the \$81,833 which the company received for turning the work over to the government.

## SHIP BUILDING AND REPAIRS.

## A NEW GREEN BAY TUG.

Nau Bros., of Green Bay, have laid down the keel for their new tug, and a force of men is busy getting out the frames. She is to take the place of the Charnley, which they sold to Chicago parties in the autumn, but will be larger, in fact the largest and most powerful boat of the kind on Green Bay, excepting the Escanaba tug Monarch, and is to be provided with all modern appliances. She is intended not only for harbor work, but for anything in the line of heavy towing and pulling, which will include wrecking. The boat will be ready for next season's work.

## ACTIVITY AT WYANDOTTE.

The Detroit Dry-dock Co., has awarded to Vinton & Co., of Detroit, a contract to build a new shop at its Wyandotte yard. The building will be 300 feet long and 120 feet wide, and will be located adjacent to the slips. Both slips are being lengthened to 465 feet. Supt. F. A. Kirby has been spending some little time at eastern shipyards, and the new machine shop and its tools will be of the most modern and improved patterns. The shop will be equipped with a 200 horse power engine, and three large boilers. The shop is one that can be rapidly constructed, and spring will find the Wyandotte yard second to none in the matter of equipment.

One of the new tools is a punch that will take in a plate eight feet wide, and will punch holes varying from 1-16 of an inch to six inches in through a plate of any thickness up to an inch. The weight of this tool is 20 tons.

Another of the tools is a plate-joggling machine, an illustrated description of which was printed in the RECORD in its issue of August 1. This joggles or flanges the plates in a way to fit them closer together, and effects a saving in riveting and other work, and in the additional packing made necessary by the old system when plates overlapped.

Five hundred men are pushing work on the steel steamer for C. R. Jones and others, of Cleveland, and on the 420-footer for E. M. Peck and others. Material is being placed in the yards for the two huge Rockefeller steamships and as soon as construction begins 1,200 more men will be given work. The Wyandotte yard is beginning to see a season the busiest in its history.

## AT THE WHALEBACK YARD.

A whaleback steamer and barge are now under way at West Superior for the fleet of the American Steel Barge Co., and the keel blocks for the huge Rockefeller pair are in position. As has been the case at other shipbuilding points on the lakes, vexatious and expensive delays result from the slow delivery of material required for immediate use. The Illinois Steel Co. has the contract for the material for the vessels now under way, and the Carnegie Steel Works will furnish material for the second pair. It is expected to have the first pair ready about August 1. The two steamers will cost \$475,000, one \$230,000, and the other \$245,000. Each of the pigs will cost \$145,000, and the total investment in the four vessels will therefore be about \$765,060. Employment is given to about 500 persons, and as soon as work is fairly begun upon the Rockefeller contract the force will be increased to 1,000.

## IMPROVEMENTS AT THE WHEELER YARD.

The steel shipbuilding plant of F. W. Wheeler & Co., at West Bay City, is receiving improvements which will cost \$100,000 and make it one of the most extensive plants on the lakes. Two more slips will be dredged with a length of 500 feet. Six electric motors have been ordered, and much big machinery, including two ten-ton hoisting derricks, a ten-ton traveling crane, a ten-ton locomotive crane, etc. About 1,200 men are now employed regularly.

## STEAM LAUNCHES FOR MEXICO.

The first of several steam launches of special design for Southern Mexico, has just been shipped by the Marine Iron Works, Clybourn and Southport Ave., Chicago, the destination being 3,200 miles from that city. Shipments of this character are safely made by rail for the small and medium-sized launches, but for the larger

work the same company builds only the "complete outfit" of marine machinery and equipment, for the native boat builders.

## GENERAL REPAIR WORK.

CLEVELAND.—The Curry and Wallula still occupy the Ship Owners' dry-dock. The Cambria finished her repairs at the Cleveland dry-dock last week, and the Grecian went in Saturday and still occupies the dock. Six or seven plates had to be removed.

CHICAGO.—At Miller Bros.' shipyard the steamer Niko was in dock and received five new planks on her bottom on the starboard side, which was damaged by striking a rock on her last trip up last season. The steamer City of London is in dock for some new bottom planking and other necessary repairs; the schooner Maria Martin is receiving 22 new stanchions and some new stringers, covering board and rail. The extensive repairs on the barge Nicholson are about completed, and she will go out of dock this week.

At the Chicago Shipbuilding Co.'s shipyard the Ann Arbor Car Ferry Steamer No. 2 was in dock and had her shaft straightened and received a new wheel and considerable repairs to her sides and upper works. The steamer Josephine is in dock receiving two new planks on her bottom and some calking.

SAULT STE. MARIE.—During 1895 Joseph Pullar did a business of more than \$10,000 in repairing and rebuilding boats, dredges, etc. Among these were the following: Rebuilding dredge No. 1 and tug Bues and repairing dredge No. 2 and tug Andrew Gale, for C. H. Mitchell & Co.; repairing dredge No. 3 for H. W. Hubble & Co.; repairing of Arnold line boats and many others from up and down the Great Lakes. Mr. Pullar is now building a new dredge for Carkin, Stickney & Co. It will be completed by the opening of navigation. Among the vessels now in the yard to be overhauled and repaired this winter are, Capt. W. P. Stirling's side-wheel steamer Northern Belle; R. H. Luckes' tug Gazette; the Lake Superior Power Co.'s tug Jessie; Hingston & Wood's tug Campbell; P. M. Church & Co.'s tug Pioneer, and C. H. Mitchell & Co.'s two dump scows.

DETROIT.—The steamer Fayette Brown is in the Detroit dry-dock to be lengthened fifty feet. The Northern Wave will occupy the dock until March, when the Selwyn Eddy will take her place. Capt. Wm. Murch is superintending the repairs on the Wave.

## REPAIR NOTES.

Underwriters want a purchaser for the barge A. C. Maxwell, which dragged ashore in Green Bay last November. Only one bid and that for a few hundred dollars only has been received.

Timber is being hauled to Morley's shipyard at Marine City for the new vessel now building there.

The new barge now on the stocks at Kingston for the Montreal Transportation Co. will be named Melrose.

The fishing tug Julia Hammel, owned by Luebke & Luebke, of Two Rivers, Wis., is receiving a new boiler at Sheboygan.

Repairs on the George Presley have begun at Milwaukee,

The repairs to the steamer Ira H. Owen, in Craig's dry-dock, were completed sufficiently to float her Saturday. The Nipigon and Schenck were docked Monday.

## PROTECTION AGAINST FIRE.

The Standard Oil Co.'s lake oil barges carry electric lights that are vapor proof, so that there is no danger of an explosion or fire from them even when naphtha is being carried. Two large pumps in the forward part of the boat are used to discharge the cargo, and when these are run at full capacity the cargo of 10,000 barrels can be discharged in six hours. A double bulkhead between the boiler room and the oil tanks is kept full of water all the time as a protection against fire. Two powerful steam pumps also supply a protection from fire.

## TOTAL LOSSES.

As compared with previous years, the total losses during 1895, were as follows:

	1895.	1894.	1893.
Number of vessels.....	63	54	65
Capacity, net tons.....	48,975	31,415	41,625
Value of vessels.....	\$1,300,000	\$522,750	\$1,172,200

## HIGH PINTSCH GAS BUOYS.

The system of lighted buoyage now coming into vogue has made itself so popular that a number will probably be seen on the great lakes within a few years, in addition to those already provided for. So far New York is the only harbor that has been given a perfected system of lighted buoys, but Boston, San Francisco and some of the lake cities are partly supplied, and the Lighthouse Board confidently expects a large appropriation from congress to enable them to complete their system. A large Pintsch gas buoy has been placed on Harding's ledge, off the entrance of Boston harbor, and an old fisherman recently said that this dangerous spot had never been so satisfactorily marked. There is also one in operation at Erie, Pa., which has proved very satisfactory. One is to be placed at Lansing Shoal, Lake Michigan, and one in Poverty Passage, Green Bay, and the Lake Carriers' Association has asked for several more.

The buoys at New York are electrically lighted and several in number. They are placed along Gedney's Channel, the main ship channel, three red on the starboard hand and three white on the port hand in entering the harbor. They are lighted by wires running from the power house on shore at Sandy Hook and so far have given satisfaction, although the expense of running them is very great and they are liable to get out of order on account of accident to the wires or to the machinery on shore. By the Pintsch system if an accident should happen to one light the others are not affected. The Suez canal was first lighted by electricity, but it was found to be too costly and unreliable. A change was made to the Pintsch system with forty buoys and about the same number of beacons.

There are no other electric buoys in use in this country, and there is but one other system of lighted buoys; this is the Pintsch light buoy, the illuminating power of which is gas stored in the hollow body of the buoy under a pressure of twelve atmospheres and feeding the burners by the power of expansion. The light is protected from the weather by glass sides and an iron cage and is clear and steady, being visible at from six to seven miles in an atmosphere of average clearness. The economy in gas is a great feature, the cost of consumption being only seven cents a day of twenty-four hours.

Class A, the largest of the Pintsch buoys, is capable of burning for a year without refilling, but its great weight of eleven thousand pounds makes it difficult of handling by the tenders and a small size of six months light capacity will probably be more generally used.

On the score of durability, simplicity, steadiness and economy it is likely that this buoy will be used in preference to others and preparations are being made to extend the system as fast as money can be obtained for the purpose.

It is proposed to place the buoys at the entrance and along the sides of ship channels, red to starboard and white to port on entering, and others will doubtless be used as danger signals marking obstructions at points where lighthouses are not erected.

The lighthouse officials are generally delighted with the results so far obtained. The Naval Secretary of the board, on being questioned relative to the value of the lighted buoys, said that they were undoubtedly of the greatest permanent aid to navigation, and that although most of the old merchantmen were dubious at first in regard to their success, there would be a "wild howl of rage and expostulation" should it be proposed to give them up.

This buoy is manufactured by the Safety Car Heating and Lighting Co., 160 Broadway, New York.

## NOTICE TO MARINERS.

Notice is given by the Lighthouse Board, that, on the opening of navigation, 1896, there will be established at this station, on the W. pier at the entrance to Portage Lake Ship Canal, NW. side Keweenaw Peninsula, S. side of Lake Superior, a 10-inch steam whistle to sound, during thick or foggy weather, blasts of three seconds, separated by silent intervals of 17 seconds' duration. The fog-signal building is a brown corrugated iron structure, and stands immediately in rear of the light tower on the pierhead. On the same date the fog bell heretofore sounded at this station during thick or foggy weather will be discontinued.

## UNITED STATES STEAM RAM KATAHDIN.

A good deal of curiosity has been excited as to the appearance and details of construction of the United States steam ram Katahdin, as a result of the Congressional action permitting her acceptance. The Katahdin was built by the Bath Iron Works, of Bath, Me., and on her trial trip failed to make 17 knots an hour, the speed demanded by the contract. After careful investigation, however, it was found that this was not at all the fault of the builder, but that her peculiar model almost precluded this speed on any degree of power. The indicate horse power was considerably in excess of requirements, and on these grounds the Katahdin was accepted.

The Katahdin is the product of many years of research and careful investigation by Admiral Ammen of the Navy. Her builders have had to contend with several serious drawbacks in getting her near to the contract speed of 17 knots an hour. Her lines are not such as to allow of a free throw-off of the water as she goes along; in fact, as one old salt said about her the other day, "she pushes the whole Atlantic ocean ahead of her."

She is of the whaleback type, and in some respects—those of low freeboard and heavy hull protection—resembles the common idea of the monitor.

Intended to ram the enemy and in that way to do the most possible damage, her whole offensive power is concentrated in her formidable ram head of cast steel. Virtually the vessel is an immense automatic aquatic projectile of 2,183 tons, driven by a double set of triple-expansion engines at the rate of nearly 17 knots an hour, and able to deliver a blow of 56,000 foot-tonnes. The

cylinders of 25 36 and 56 inches, having a stroke of 36 inches, and a piston speed of 150 revolutions a minute. There are two main double-ended boilers 13 feet 8 inches by 22 feet 6 inches, and one auxiliary single-ended boiler 13 feet 8 inches by 11 feet 7 inches, giving a total grate surface of 354 square feet and a total heating surface of 13,190 square feet, the working pressure to be 160 pounds.

Some idea of the difficulties experienced in getting the required speed out of her may be had from the fact that the engines of the Katahdin have already developed nearly 6,000 horse power. This is an enormous horse power for a vessel of her size, and had the lines of her hull been of even an ordinary nature, or conducted to speed in the least degree, no difficulty would have been found in driving her ahead at a much higher speed than that required.

It must be remembered, however, that while most of the faster cruisers could undoubtedly walk away from the Katahdin in a straight-away run, it is very unlikely that they could be maneuvered at close quarters so quickly as to avoid her if she attempted to ram.

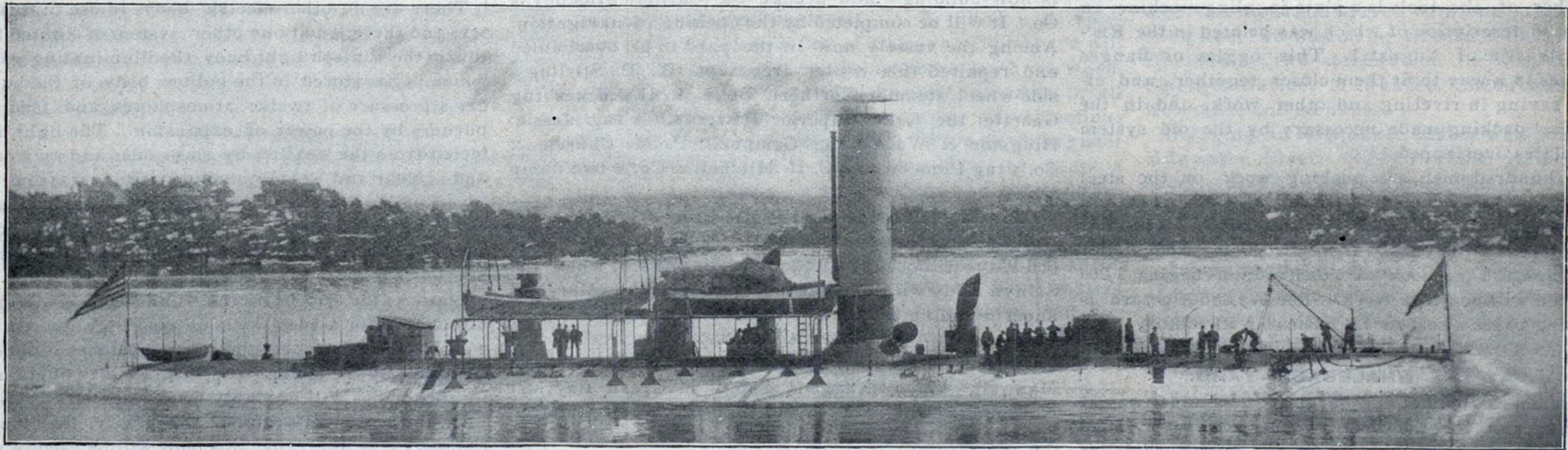
As at first constructed the bow of the vessel consisted of the ram in its naked wickedness, but it was found on the first trial that the slope down to the water's edge tended to throw a good deal of water upon the deck, and so a false bow has been added, which covers the ram and brings the bow up above the water.

When the vessel is submerged to her fighting trim she buries the knuckle of her heavy armor deck plating a foot below the surface, and, as an old Jack Tar expressed it, "Blow me, if she don't carry her water-line on deck!" In action she is intended to strike fairly

time for the round trip being two hours 6 minutes and 17 seconds. When the tidal corrections were applied to the course it was found that the distance actually traveled by the Katahdin was 33.91683 knots. The board divided this by the time consumed and found that the true mean speed of the ram was 16.1146 knots per hour.

The mean draught of the ram when she left New London was 15 feet. The coal consumed during the trial lightened her somewhat, and upon her return it was found that her draught was 14 feet 8½ inches. During the run there was a moderate surface sea but no swell. The vessel neither pitched nor rolled. She carries her helm amidship. During the entire trial the tide was ebb, setting to the eastward, and was slightly stronger on the return run. The board is enthusiastic about the turning qualities developed by the ram. Its report states that at the end of the second run, and before the speed of the vessel was virtually diminished, the helm was put hard over both ways, the time from hard-a-starboard to hard-a-port being 17 seconds. The steering gear is thoroughly efficient and works smoothly and easily, and the vessel turns promptly and rapidly.

On the first run the mean of the revolution of the starboard engine was 151.5 and port 146. The average revolutions of the starboard engines were 146.49 and port 143.5. The mean steam pressure on this run was 168 pounds and the average 166.5 pounds, and the mean air pressure to 1 inch of water was 2.4 and the average 1.35. On the return run the mean of the revolutions for the starboard engine was 150, average 148.49, and the mean for the port was 145, average 144. The mean steam pressure was 168 pounds and the average 167.1.



UNITED STATES STEAM RAM KATAHDIN.

structural bracing of the vessel has been carefully designed to insure great strength, and an equal distribution along the axis of the whole body of the shock of the impact, the cigarlike form of the hull facilitating that end.

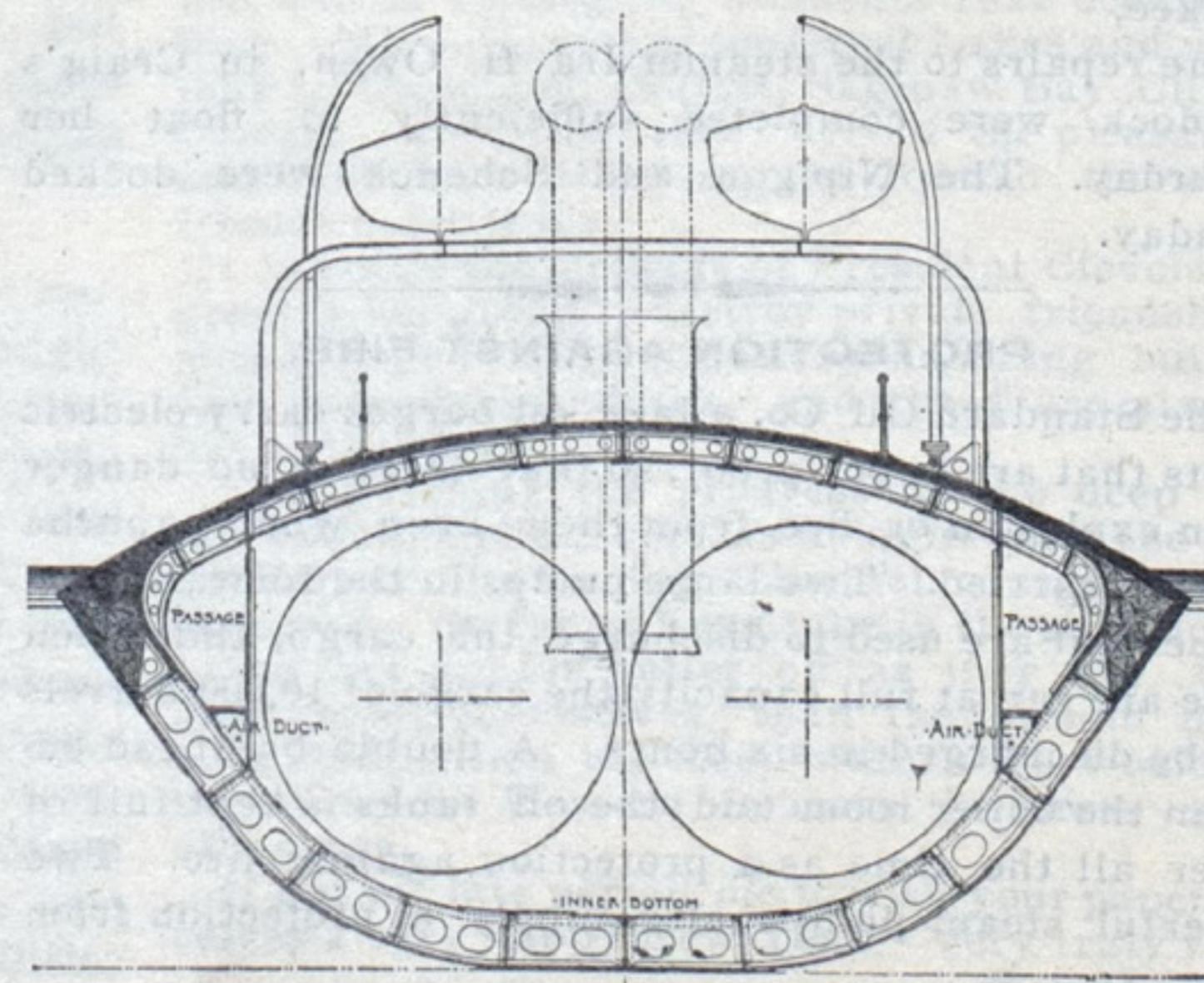
From the collision bulkhead to the stern the vessel has an inner bottom, and between the inner and outer bottoms and the inner skin and deck armor the craft is divided into more than a hundred water-tight compartments, and by flooding certain of the compartments of the double bottoms the vessel is submerged to her fighting trim. To shield herself from the blows of the enemy, the Katahdin will depend upon the deflective power of her curved armor, which tapers from the outboard strake in toward the center line from 6 to 2½ inches, and upon her limited exposure of hull, the conning towers, ventilators, and smoke pipe being the most important targets for an enemy's fire. The four six-pound rapid fire guns are to repel torpedo boats. The armor throughout the vessel is of nickel steel. All the hatches leading below through the armor deck are to be protected by battle plates, and the smoke pipe and ventilators are to have inclined armors six inches thick.

The conning-tower, which is placed well forward, to give a commanding view in fighting the ship, is to be almost eighteen inches thick.

The vessel's principal dimensions and special features are: 250 feet 9 inches on load water line; 43 feet 5 inches breadth, extreme; 15 feet mean draught; 239.88 tons total coal bunker capacity. The engines are of the triple-expansion type, one set actuating each screw, and in separate water tight compartments, with

head on, the sharp edges of her side to cut like an opster knife into the enemy's plating below the water line. The possible consequences of a mass of such proportions rushing at a foe have been shown with awful impressiveness in the case of the ill-fated Victoria.

In all but speed the Katahdin comes fully up to her



SECTIONAL VIEW OF THE KATAHDIN.

contract requirements, and in this she falls very little short. The report of the trial trip states that the time occupied by the ram in making the run west of 17 knots was 1 hour 5 minutes and 33 seconds. The run back was made in 1 hour 0 minutes and 44 seconds, the total

air pressure to 1 inch of water was 2.4 mean and 1.71 average. The Katahdin returned to New London under natural draught, making between 13 and 14 knots. Crossing the sound she encountered a moderate sea. Her rolling motion was very slight and easy, the seas breaking completely over her hull.

In concluding its report the board say that they found that the vessel is sufficiently strong to carry her armor and armament, equipment, coal supply, stores, etc. Her hull, fittings, equipment and machinery are strong and well built and in strict compliance with the provisions of the contract. The board find that in a number of minor instances the ship is not fully completed and enumerates a number of small articles with which she must be supplied before she can be considered finished. The report states that the ram is noticeably free from vibrations at full speed. Her minimum heeling angle at full speed with helm hard over was found to be 1½°.

The board was especially pleased with the ventilation of the ram. Although she is covered entirely over by a plated deck the air inside was thoroughly pure. The report states on this point that the "ventilating system appears to be exceptionally efficient." Chief Naval Constr. Hichborn directed that the Katahdin be supplied with her present system, and the board pays considerable attention to its good qualities.

The RECORD is indebted to the Army and Navy Journal for the illustration of the Katahdin, for which it was especially prepared from a photograph. The cross section here shown was kindly furnished by Harper and Bros.

**HOME STUDY OF ELECTRICITY.**

The illustrations accompanying show the dynamo which belongs with an equipment of electrical apparatus manufactured by the Institute for Home Study of Engineering of Cleveland, O., for its electrical students and for schools and colleges generally.

One engraving shows the 250-watt dynamo completed and connected as a four-pole shunt-wound direct-current machine operating with four brushes. The other represents the machine as it is received by the students of the Institute who are pursuing the electrical course. That course requires the student to have an equipment of electrical apparatus for demonstrating the principles, verifying the laws and other data, and doing independent work. The Institute for Home Study of Engineering, it may be said, was unable to find in the market apparatus adapted to the needs of a student pursuing his electrical studies alone, and its engineers and managers designed as well as provided a shop for manufacturing an equipment that serves such purposes admirably and at the same time is a moderate tax upon his resources. The course requires the actual construction of a dynamo by the student. The machine is sent with all parts finished, together with the wire to wind the armature and fields. The scientific part of the work, the calculation of its electrical and magnetic proportions, the general design, etc., is done before the machine is received and he is ready to perform the practical part, i. e., winding the fields and armature and connecting the machine in the many different ways which its design renders possible. This is the only part of the dynamo construction that the electrician need know how to perform himself, the machine work, the building of the commutator and similar parts being done by the regular machinists and the electrical machinists. It is not necessary to know the various parts and materials grouped around the dynamo.

It will be noticed that there is a set screw in the head of each commutator bar. This is for conveniently changing the connections of the coils. There are twenty-five changes, each one making a different machine—of course in principle chiefly, as the same armature and fields are used in them all—fifteen being as a direct current and ten as an alternating current machine. For the alternating current work collector rings which can be conveniently slipped on and off the commutator are furnished. The machine does not have to be separately excited when running as an alternator, means having been provided for self-excitation. All the dynamo work is laid out in the course, and the students' work being under the constant supervision of the institute's instructors, difficulties which might prove insurmountable to one working without direction are easily overcome. The upright piece in both illustrations is a foot rule by which the sizes of the frame are readily shown. This is not only an experimental, but a commercial machine, being well made throughout.

The combined volt and ammeter, the illustration of which there was not space to admit, is for use in the experimental work. It is a new design and is employed for both direct and alternating currents. It is being used in central stations and is giving satisfaction for all the work it has been put to.

For further particulars concerning this apparatus and the work of the institute for Home Study of Engineering, address the Scientific Machinist Co., Cleveland, O.

**STEAM VESSELS AND MARINE ENGINES.**

BY G. FOSTER HOWELL.

Under the above title the publishers of the American Shipbuilder have just issued a handsome book of views and descriptions of most of the typical steamships of America, with various designs of compound, triple and quadruple expansion engines. It is printed on very fine, highly calendered paper, and includes in its illustrations the lake steamships North West and North Land, Joseph L. Colby, C. W. Wetmore, machinery of the Christopher Columbus, steamyacht Wapiti and her

engines, and others. A closing chapter is devoted to American sail vessels, and is also profusely illustrated. Among the portraits of men prominently connected with American shipping interests are Philip Hichborn, chief constructor, United States Navy; John Roach, Chester, Pa., the late great shipbuilder; William Cramp, founder of the Cramp Ship and Engine Building Co.; Chas H. Cramp, president of this company; George W. Melville, chief engineer U. S. Navy; Irving M. Scott,

**NOTES.**

The total value of the exports of merchandise from the United States in 1895 was \$824,896,522, as compared with \$825,102,246 in 1894. During last year the excess of exports over imports was \$3,269,884, and in 1894 the excess was \$148,789,307.

CAPT. HENRY GLASS, who commanded the Texas, is highly pleased with that boat. He says that when all her defects are remedied she will be a very fine craft.

As a sea boat, he declares she is excellent, and makes a splendid fighting platform. Capt. Glass has been assigned to duty in connection with the Texas pending the making of changes.

During 1895 the American Line carried 16,146 cabin passengers on 50 trips; the Cunard Line on 57 trips carried 18,856 cabin passengers; and the White Star Line made 51 trips and carried 14,085 cabin passengers. The North German Lloyd Line led the list in the matter of steerage passengers. The total number of cabin passengers carried by all lines was 96,558 and 258,560 steerage passengers on 792 trips.

THE French are laying the keel-plates of a fleet of fast cruisers, to be armed with quick firing guns. The Russians are pushing forward the construction of a battle-ship of 13,000 tons, the Olyabya—of three swift armored cruisers of 6,000 tons each—and of two first-class, swiftest torpedo boats, at St. Petersburg,

and of more at Nikolaieff, to be ready for commission within two years. The importance of swift and well-armed cruisers for naval warfare is recognized in the French Navy, in which it has been determined that "cruisers instead of battleships shall be placed on the stocks, because cruisers are better adapted to the conditions of modern naval warfare."

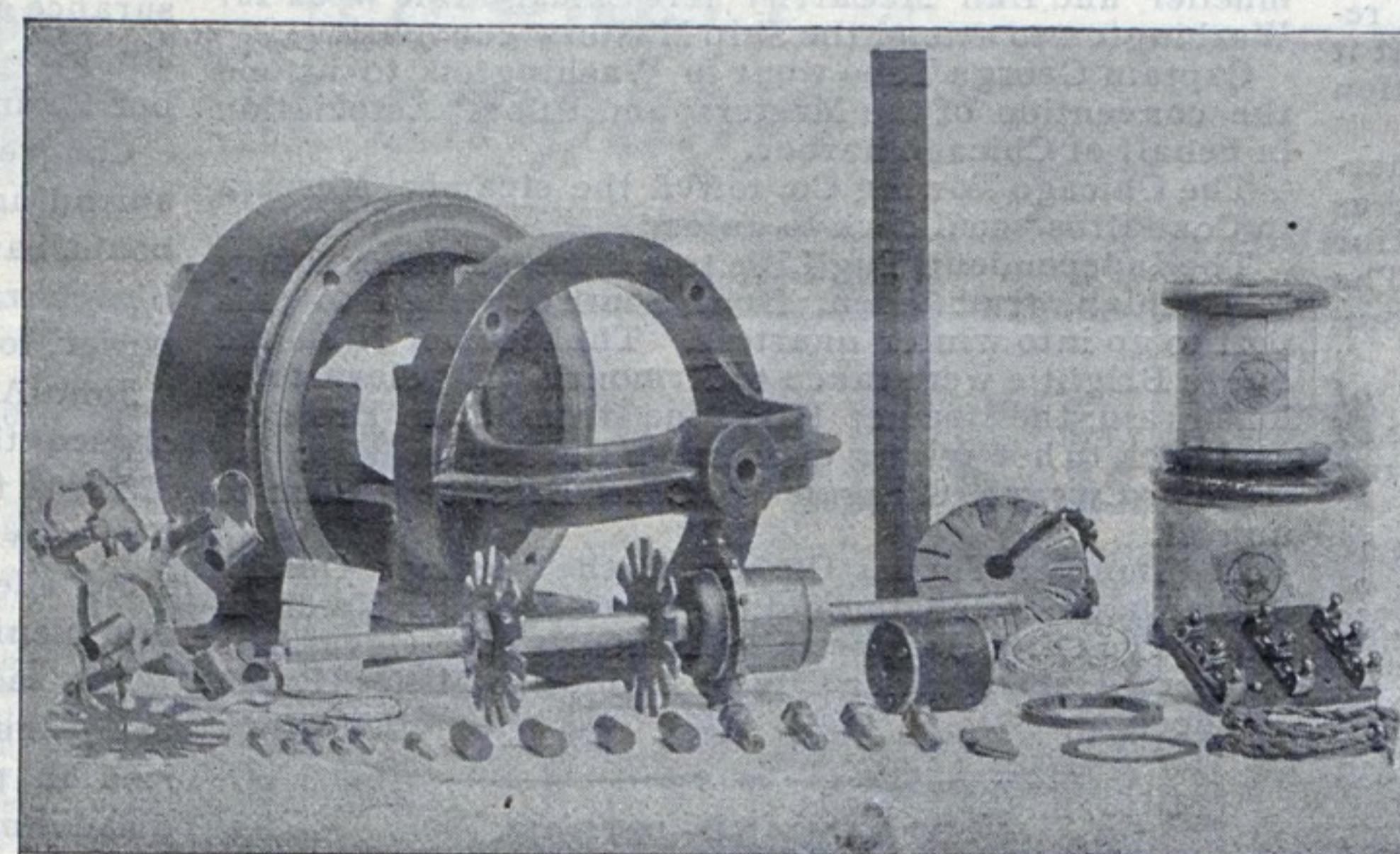
THE gunboat Helena will be launched January 30 at works of the Newport News Shipbuilding and Dry Dock Company.

The event will be looked forward to with a great deal of interest. The launching of the Nashville and Wilmington, sister ships of the Helena, which occurred some months ago, was very successfully accomplished, and those who witnessed the event thoroughly enjoyed the generous hospitality of the Newport News Company. The Helena is further along toward completion than either the Nashville or Wilmington was at the time they were launched, and a shorter period therefore will now be necessary to make her ready for government service.

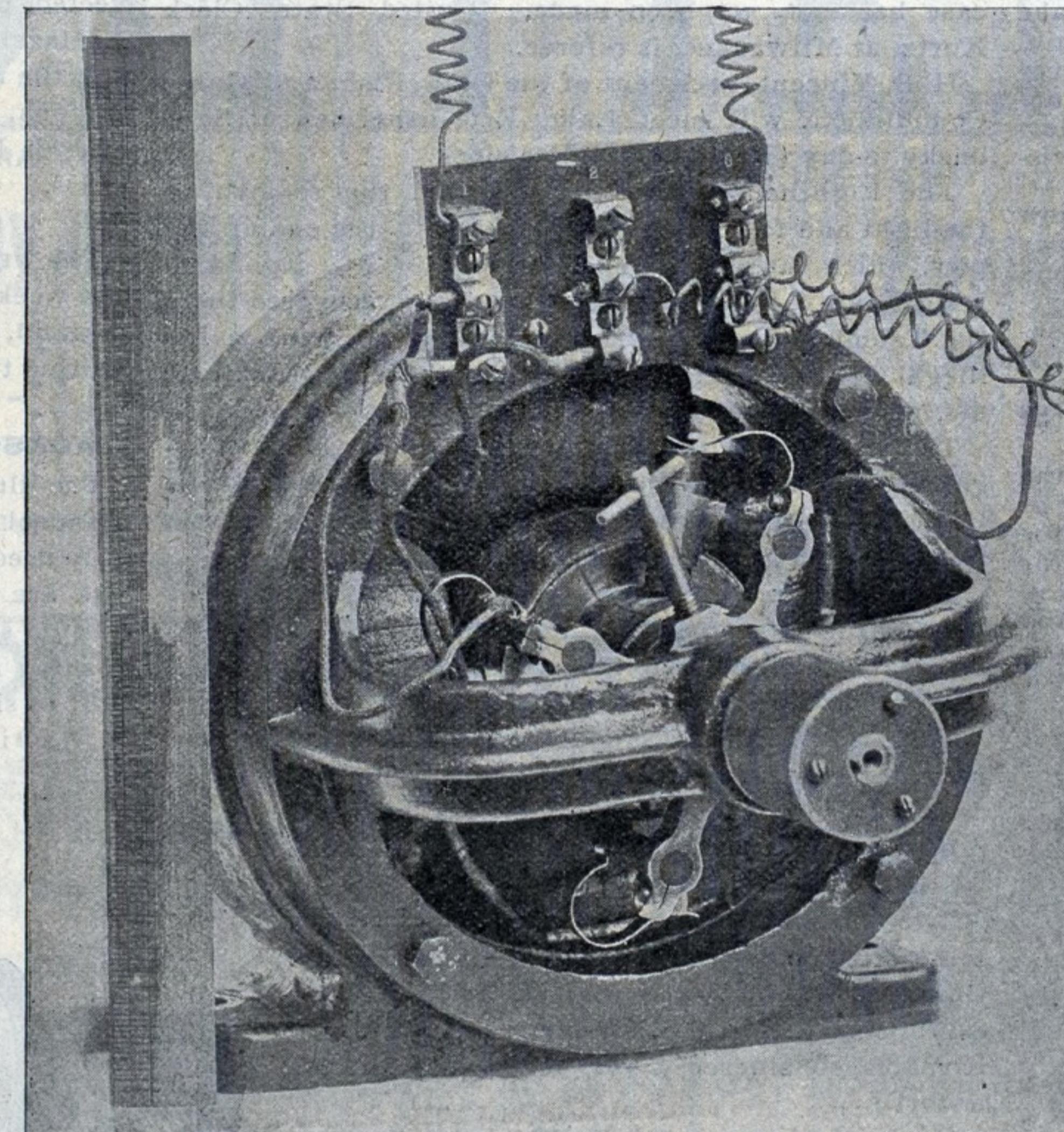
THE new type British cruiser *Vindictive*, which will be put in hand at Chatham early in the year, will be 320 feet in length, with 57 feet beam. Her draft will be 22 feet, and her displacement 5,750 tons. She will be entirely of steel, and wood and copper sheathing will not be employed. The cruiser will have a heavy steel deck to protect her engines, boilers, magazines, etc. Her engines will be of the triple-expansion type. The armament will comprise 6-inch, 4.7 inch, and 12-pounder quick firers, besides machine guns and torpedo tubes. The 6-inch guns will fire fore and aft, while the 4.7-inch and 12-pounder guns will be on each broadside. The speed of the cruiser under natural draft is expected to be 18.5 knots, with a possible additional knot by means of forced draft.

**HARPER'S MAGAZINE.**

The February Harper's will be in the best sense popular. Stephen Bonsal will describe "The New Baltimore" with the aid of eighteen illustrations; Caspar W. Whitney will relate some exciting experiences in his pursuit of the Musk-Ox in Northern British America, and Henry Loomis Nelson will discuss "The Passing of the Fur Seal," and find a cause in the failure of Great Britain to support the findings of the Paris Tribunal. There will be capital short stories, and the military spirit will be satisfied with Poultney Bigelow's stirring description of "The German Struggle for Liberty" against Napoleon and the Prussian King; Theodore Roosevelt's narrative of St. Clair's disastrous expedition against the Miami Indians a century ago; and the story of the capture of the Maid of Orleans, by the English, told in "Personal Recollections of Joan of Arc."



DYNAMO READY FOR WINDING.



250-WATT EXPERIMENTAL DYNAMO.

wooden shipbuilder and founder of Webb's Academy, Fordham Heights, N. Y.; Horace See, engineer and naval architect, New York; Richard P. Joy, of Detroit, the patriot, friend and advocate of American shipping interests, and others. The work is bound in a form convenient for handling and is well suited for either library or office.

The newspapers a few weeks ago announced all over the world the successful ascent of Mt. Ararat by a party of Russians. *Scribner's Magazine* for February contains an article by H. F. B. Lynch, describing the successful ascent which he made in 1893, with a series of graphic illustrations made from his own photographs. It is a remarkable description of a remarkable feat.

## NEWS AROUND THE LAKES.

## BUFFALO.

*Special Correspondence to The Marine Record.*

A special effort is being made to bring the city council to see that the best thing the City of Buffalo can do is to make some harbor improvements on its own responsibility. State funds pay for dredging out the Ohio basin, and the government appropriations for outer harbor improvements are rather large; but there yet remains a great deal to be done to make this port what it should be and city money expended in this direction will certainly prove a good investment.

There is no better gauge for the necessities of a harbor than the statistics of arrivals and departures, as this indicates precisely the need for room and for proper facilities for getting in and out of port. The following figures show Buffalo's commerce, as compared with other important lake cities:

Buffalo entries—Coastwise trade, 3,669 vessels of 4,400,547 tons; foreign trade, 737 American vessels of 241,466 tons, and 352 foreign vessels of 41,979 tons; total, 5,758 vessels with a tonnage of 4,684,093.

Buffalo clearances—Coastwise trade, 3,752 vessels of 4,482,576 tons; foreign trade, 666 American vessels of 165,383 tons and 339 foreign vessels of 37,739 tons; total, 4,727 vessels with a tonnage of 466,568.

Chicago entries—Coastwise trade, 7,593 vessels of 4,588,954 tons; foreign trade, 41 American vessels of 12,239 tons and 3 foreign vessels of 1,315 tons; total, 7,637 vessels with a tonnage of 4,602,508.

Chicago clearances—Coastwise trade, 7,577 vessels of 4,521,419 tons; foreign trade, 107 American vessels of 63,100 tons and 3 foreign vessels of 1,315 tons; total, 7,687 vessels with a tonnage of 4,585,834.

Cleveland entries—American vessels, 3,286, with a tonnage of 2,735,889; foreign vessels, 477 of 93,473 tons; total, 3,763 vessels of 2,829,362 tons.

Cleveland clearances—American vessels, 3,155 with a tonnage of 2,696,758; foreign vessels, 566, with a tonnage of 123,407; total, 3,721 vessels of 2,820,165 tons.

Milwaukee—Arrived, 5,485 vessels of 3,529,919 tons; cleared, 5,408 vessels of 3,715,315 tons.

Capt. Wm. Clark visited Albany last week, and had a long consultation with engineer Adams in regard to additional water for the harbor of Buffalo and the western levers of the Erie Canal. It is proposed to take out about 200 feet of the Bird Island pier, and to build out a wing dam so as to turn a large part of the river currents into the canal. Last fall many boats were unable to leave Buffalo for weeks because of low water. It is desired that this work be done under the provisions of the canal bill.

Capt. Symonds, of the Engineer Corps, U. S. A., now located here, says that it is high time that the various marine and allied interests get together and decide upon exactly what they want in the line of harbor improvement, so that a solid front may be presented at Washington. So long as there is a division here as to the proper direction for harbor enlargement to take, just so long will congress postpone giving any attention to the matter.

Capt. Symonds has received from Washington the petition from Niagara Falls asking the setting aside of the \$5,000 left over last year from the appropriation for dredging out the entrance to Schlosser, and using it for cutting across the bar at the end of Buckhorn Island and opening the river route on the west side of Grand Island, where the water is about three feet deeper than it is on the east side. He will probably report in favor of the petition.

He is also in favor of the extension of the government survey far enough north of Tonawanda to include the blast furnace docks, a matter of about 1,000 feet. Work will proceed on the obstructions at Strawberry Island as soon as spring opens.

The Buffalo River Commissioners have filed their report on the proposed straightening of the river. The Legislature authorized the city to do this work and to expend \$200,000 on it, and the estimates of the commissioners—George Clinton, James A. Menzies, and Peter Maischois—estimate the cost at \$130,000. This will allow John Kelderhouse \$37,625 for about 20 acres of land which will be taken for the connecting channel; Arthur W. Decker and Emory P. Close, seven acres, \$15,500; John F. Harck, house and lot, \$2,040; J. L. Davidson, house, \$1,580; John Sedenberg, lot, \$2,966; Charles T. Sloan and John R. Walters, lot, \$1,494; Barber Asphalt Co., lot, \$325.

State Engineer Adams, of Albany, has called attention to the \$9,000,000 canal appropriation law, which provides for six weeks advertising before awarding contracts. This is generally objected to, as the delay thus caused will prevent much of the work being completed this year in time to be of any especial benefit to navigation. The work between Buffalo and Lockport should be done early in the spring, and it is probable that the Legislature will amend the law.

## CHICAGO:

*Special Correspondence to The Marine Record.*

J. J. Rardon and Co. have chartered the steamers Caldonia and C. Tower, Jr., and barges Moravia and Tasmania for corn at 2½c for winter storage and delivery at Buffalo in the spring.

Captain James O. Wood has been appointed master of

the steamer Thomas Davidson; Captain John McAvoy master of the steamer Walter Vail; and Captain Thomas O'Donnell master of the barge Baltic.

The tug Mosher released the steamer Geo. T. Burroughs, which got stuck in the ice off Chicago, last Wednesday.

The Independent Tug Line claim that among their patrons there are Kings, Queens, Dukes, Chiefs, States, Cities and also a Pope.

Captain H. F. Loftus, Robert Young, George W. Flood, John Jenks, and George Tebo, and Louis Windmueller and Dan McCarthy left Chicago this week for Washington to attend the Ship Masters' convention.

Captain George Tebo went to Washington to attend the convention of the Masters' and Pilots' Association in behalf of Chicago harbor.

The Chicago Towing Co. towed the steamer Mecosta to Coxe Bros.' coal dock to unload.

The Independent Tug Line towed the schooner Mary McLachlan, grain laden, from South Chicago to this port to go into winter quarters. The steamer Niko and barge Brightie were taken to Armour's "E" elevator to load grain; the steamer Pasadena from Coxe Brothers coal dock to her winter quarters in Burlington slip; the steamer City of Glasgow to Coxe Bros. coal dock to unload.

The Dunham Towing Co. towed the steamer Omaha to the Indiana elevator and the steamer V. H. Ketchum and barge Olive Jeannette to Armour's "E" elevator to load grain; the steamer City of London to Miller Bros. dry-dock.

WILLIAMS.

## FLOTSAM AND JETSAM.

The City of Toledo may be operated between Toledo and Detroit next season.

Lake Shore Dredge No. 3 was damaged \$400 by fire at Ashtabula Sunday morning.

The Ann Arbor No. 2 lost her wheel twice within a few days by striking bottom at Frankfort.

One of the cars washed off an Ann Arbor steamer floated ashore at Lily Bay, a few days later.

It will take the Ann Arbor steamers at least a month to catch up with the freight traffic they have on hand.

The assessment of damages in the Orr-Smith collision case has not yet been made. United States Clerk Kurtz, at Milwaukee, is referee.

H. B. Vincent, president of the Ohio Fish and Game Commission, will meet Lake Erie fishermen at Sandusky to-day (Thursday) at 11 o'clock.

The Lighthouse Board has directed the removal of the light and fog signal at Genesee to the end of the pier, which has been extended lately.

Kishman & Sons, of Vermilion, have recovered their tug Telephone, which was confiscated by Canada for illegal fishing, and sold at auction. Henry Kishman bid her in for \$1,075.

The directors of the new Ashtabula Tug Co. have organized by electing C. E. Grover president, D. R. Hanna vice-president, and W. A. Collier secretary, treasurer and general manager.

The steamer R. J. Stewart has gone to the scene of the Centurion's stranding on Isle Royale with two divers, two sleighs, two teams, and a hoisting engine, with which to recover jettisoned copper.

The Cedar Point (Sandusky) Pleasure Resort Co. have decided that it is impracticable to build a dock out into the lake and keep a channel dredged open. A dock may some time be built off the lighthouse point.

The War Department is evidently paying some attention to the request of the Cleveland Chamber of Commerce that an army post be established there. The bluff just west of Rocky River is considered a very eligible sight for a fort.

Capt. Andrew Johnson has sold the tug Annie D. to C. W. Strichenbach and L. C. Schiller, of Green Bay. Consideration, \$1,000. The craft will be used for picking up fish along the shores of Green Bay and in doing miscellaneous towing at her home port.

The W. & M. Railway Co. has had a small crew in charge of an engineer making soundings through the ice at Peshtigo harbor for the past week. They contemplate more improvements in the spring, and this is a preliminary to doing some dredging.

The English government, it is said, has entered into a contract with the officials of the New York, Ontario & Western for the delivery of 1,000,000 tons of coal to points along Lake Ontario and the Canadian borders. It is thought to mean that England is to supply her coaling vessels at Canadian ports, if not to establish

and supply new ones in case war should ensue with the United States.

F. C. Geeke, of Charlevoix, Mich., has sold the tug Maggie Sanborn to the Two Rivers Manufacturing Co. for \$2,500. The Sanborn will be used to make up rafts for the Temple Emory and in doing such other work as her comparatively light draft will permit.

George G. Hadley and J. P. Nagle, who have recently formed a vessel brokerage partnership and marine insurance agency at Toledo, have bought the tug Wisconsin, and have another tug in view. They will do harbor towing when the season opens.

Congressman Cobb, of Missouri, has introduced a bill amending the navigation laws so as to require ferry boats, canal boats, yachts, and all other small craft of like character, propelled by gasoline, naphtha or motor power, to be subject to the steamboat inspection service.

John A. Zangerle and others, of Cleveland, have purchased the summer resort known as Oak Point for \$25,000, from Charles R. Shepherd and Isaac Cole. The new owners expect to establish a regular boat line from Cleveland with a view to attracting excursion and picnic business next summer.

It is said that a Detroit man has discovered the lost art of tempering copper so that the metal may be utilized in place of steel where corrosion puts steel at a disadvantage. He has made both coiled and flat springs and good knife blades, and is able to weld the metal itself and to iron and steel.

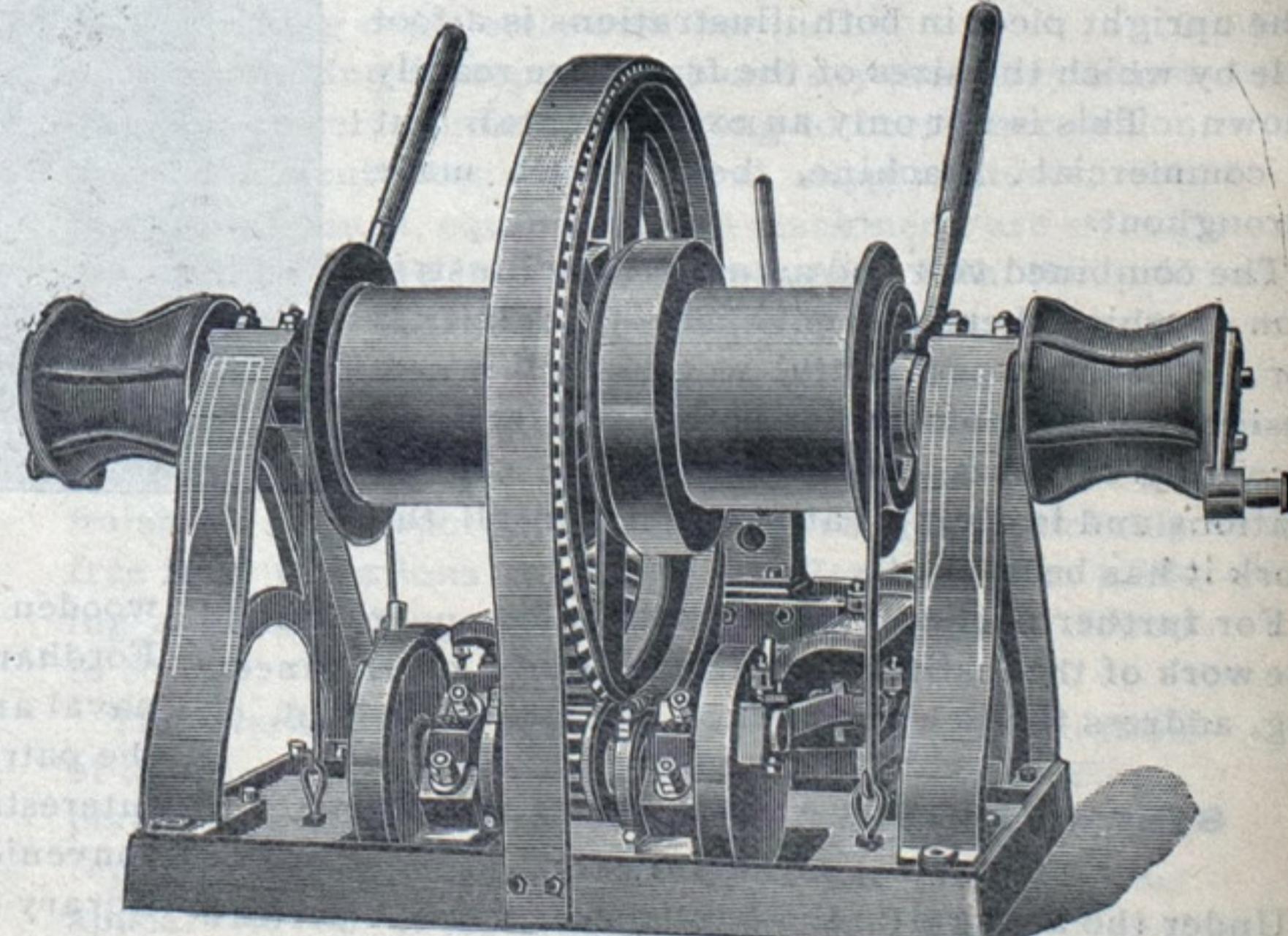
Col. Jared A. Smith, Engineer Corps, U. S. A., has been fixing the harbor lines at Toledo, subject to the approval of the Secretary of War. The lines make the channel 650 feet wide at the Lake Shore bridge, the width gradually increasing toward the mouth, where it is 1,600 feet. This will, it is thought, prevent the formation of ice gorges.

At the annual meeting of the Metropolitan Iron and Land Co., held at Milwaukee Saturday, S. S. Curry was elected president, John A. Whaling, treasurer, and H. S. Hazelton, secretary. The latter's report showed that the total output of the company's mines was 968,693 tons, as follows: Norrie, 449,689 tons; East Norrie, 125,696; North Norrie, 163,095; Pabst, 219,960; Davis, 10,253.

The writer of the very interesting communication in last week's issue regarding Buffalo harbor was Capt. H. Zealand, of Port Huron. The date and signature was omitted through a printer's error.

## JACKSON &amp; CHURCH'S DOUBLE SPOOL HOIST.

The illustration shows a well-built and powerful double spool friction deck and dock hoist such as is successfully used on freight boats and docks where one or two lifts are worked at one time. When wanted they put friction spools in place of gypsies on ends and shaft, working four lifts with one set of engines. They are built in six sizes, being 6 x 6 in., 6 x 7 in., 7 x 8 in., 7 x 9 in., 8 x 9 in., and 8 x 10 in. cylinders, or larger if required.

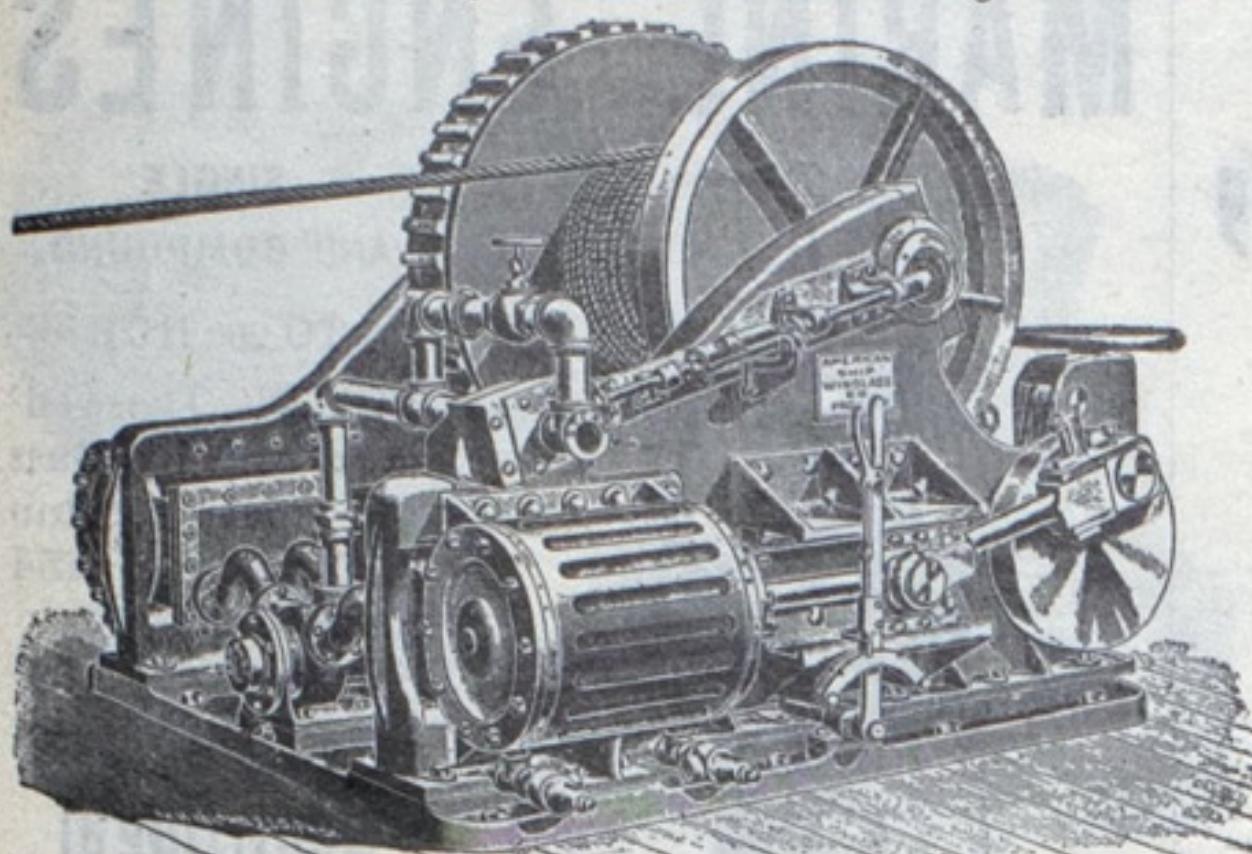


JACKSON & CHURCH'S DOUBLE SPOOL HOIST.

This concern also builds one of the best deck hoists on the lakes, having between 200 and 300 in use on fresh and salt water. Also a friction dock hoist used in coal-yards and pile driving, and twin engines for dredges, etc.

Jackson & Church, Saginaw, Mich., will furnish further information on application.

The Shaw & Spiegle Patent Steam Towing Machine.



Patented June 5, 1888, and July 16, 1895.

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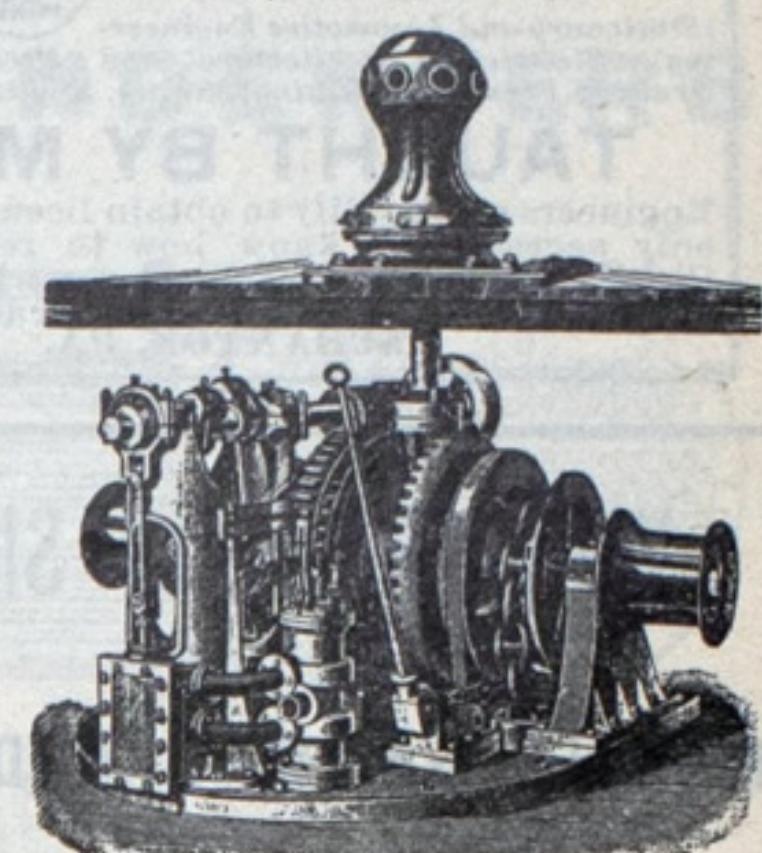
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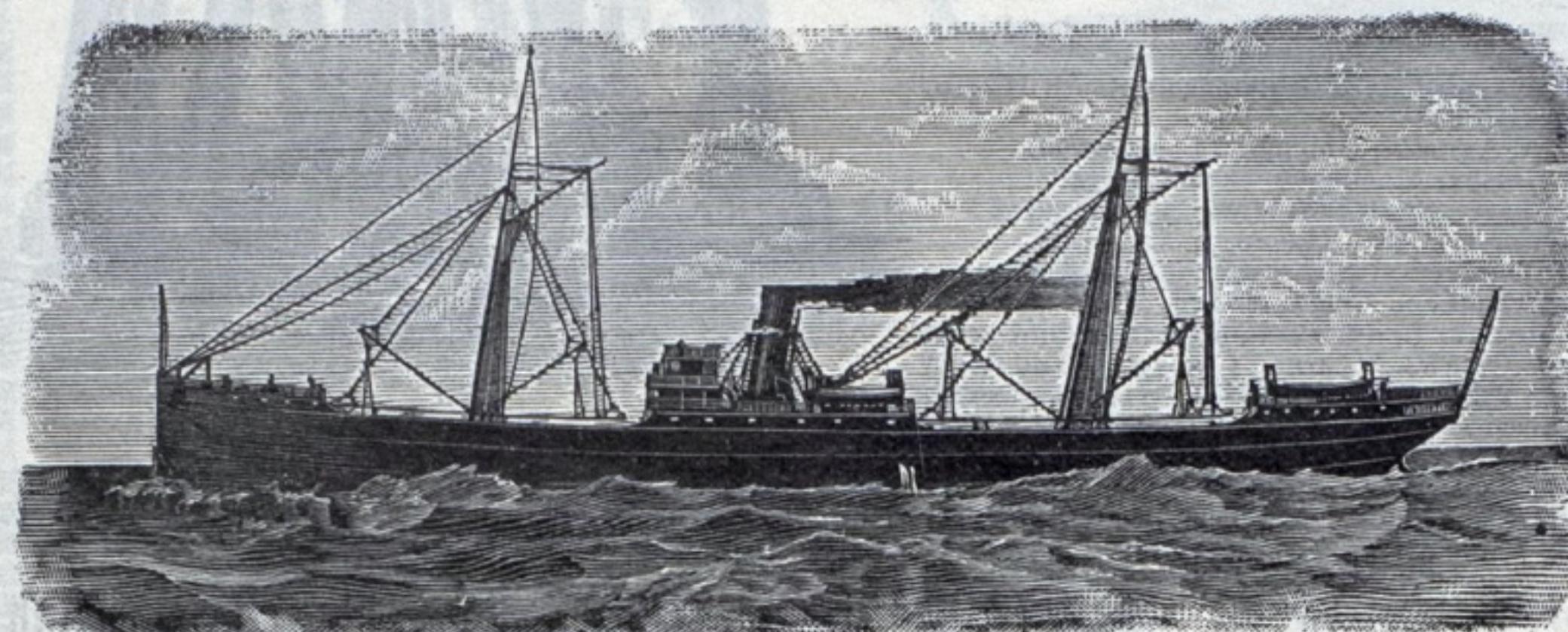
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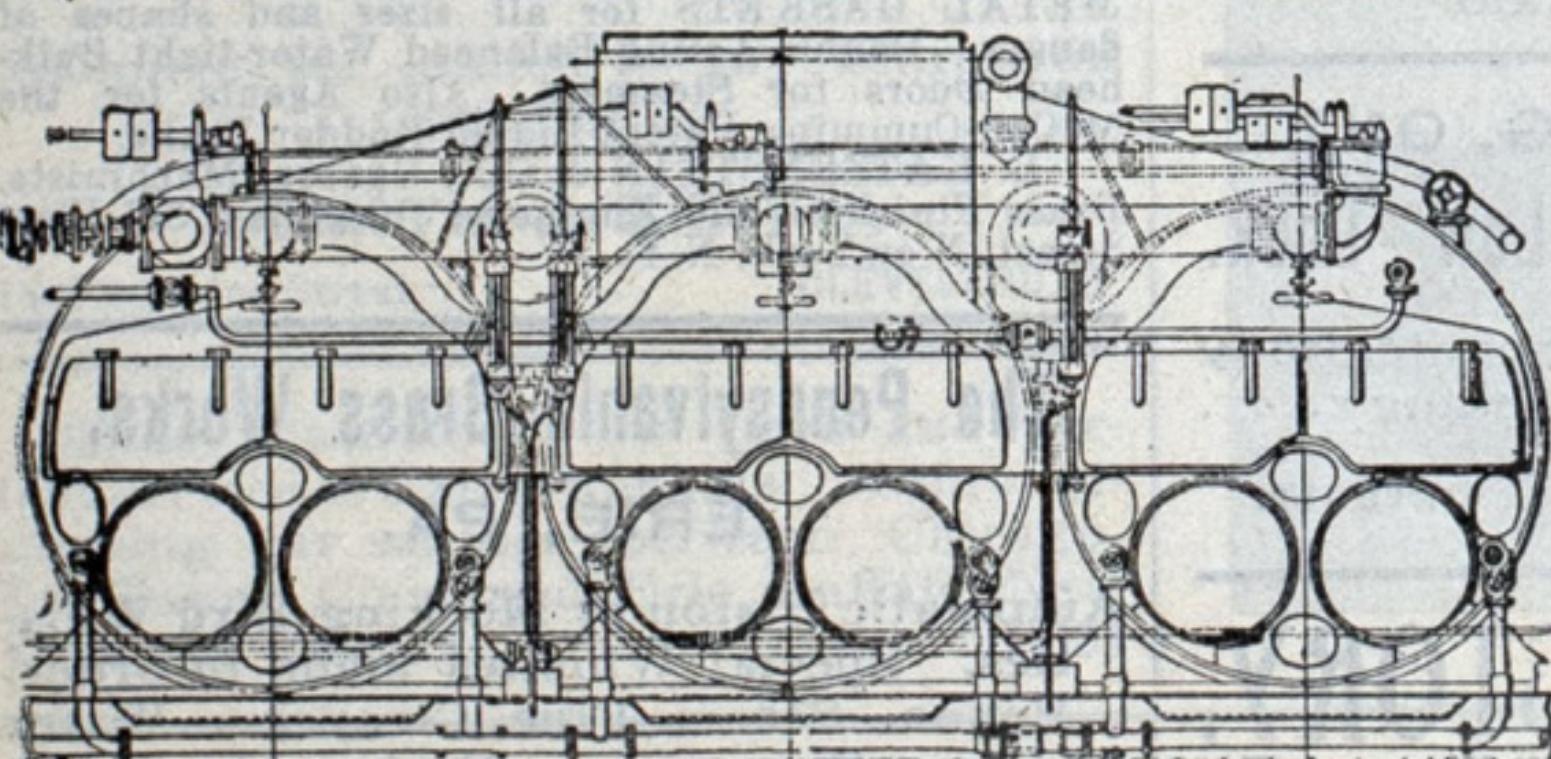
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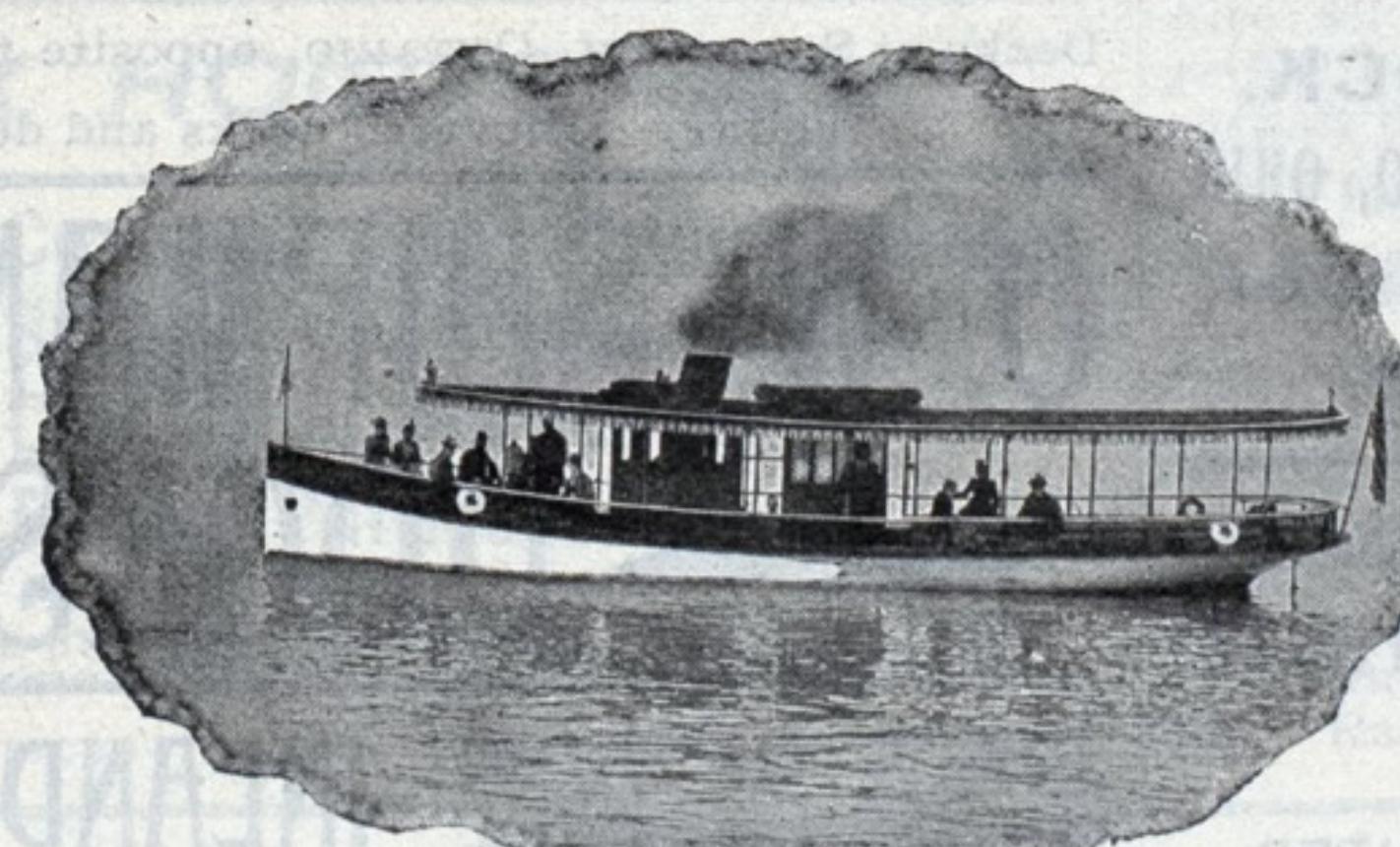
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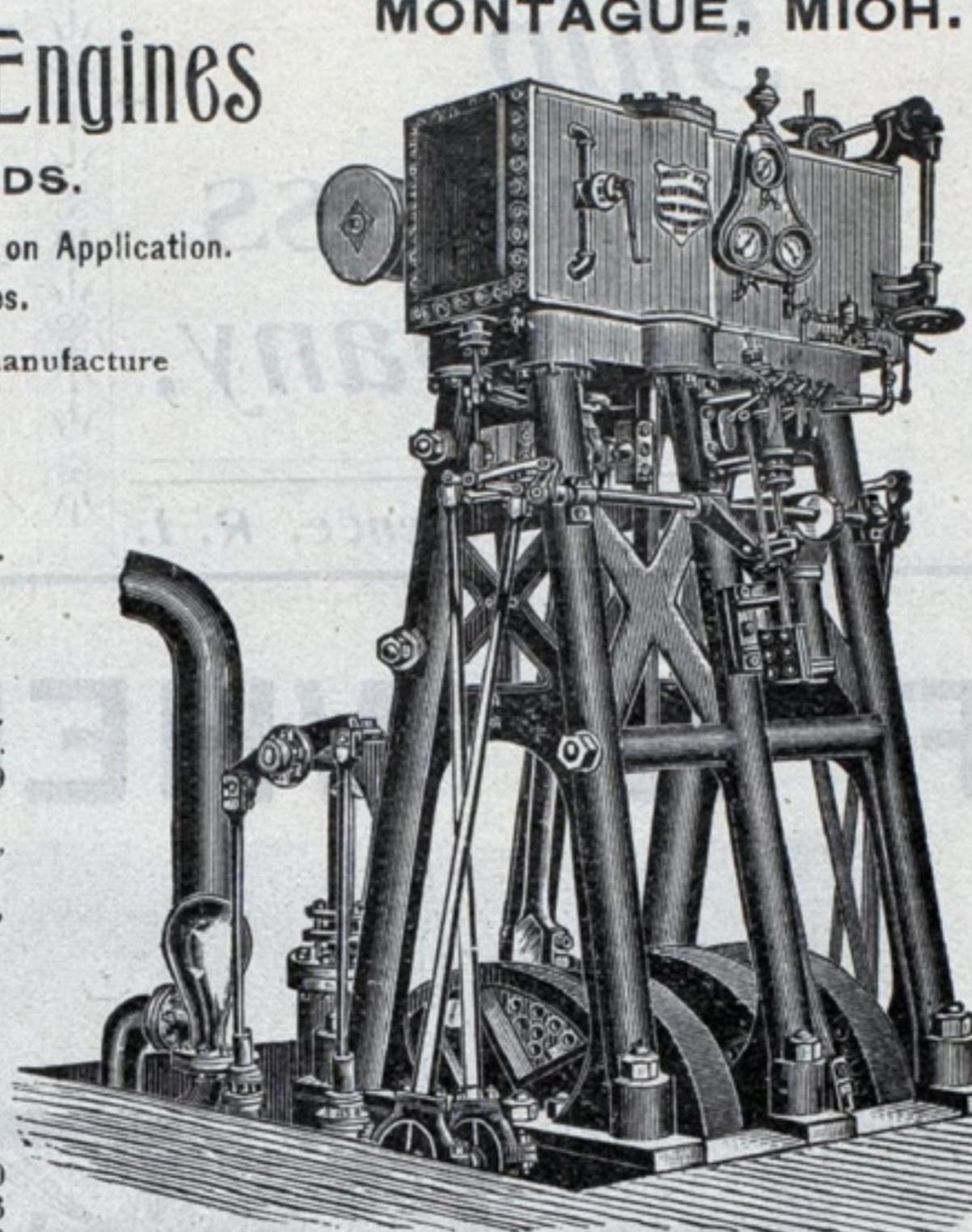
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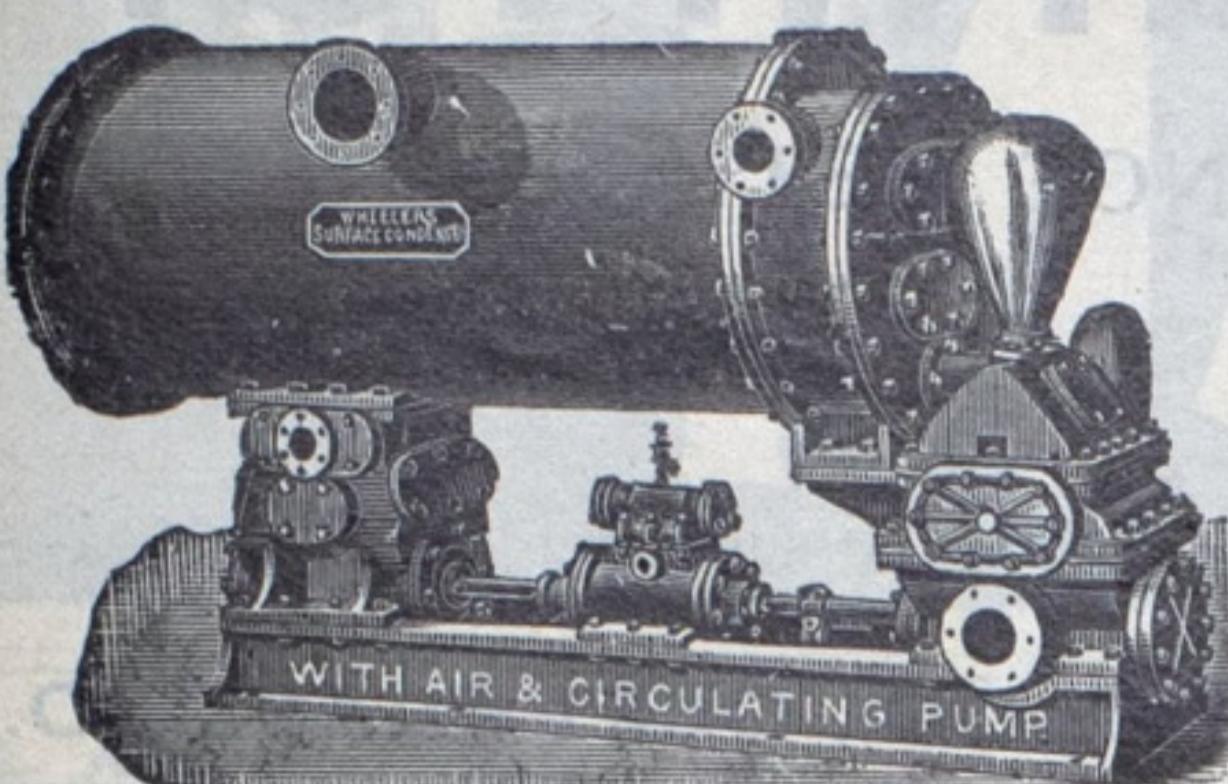
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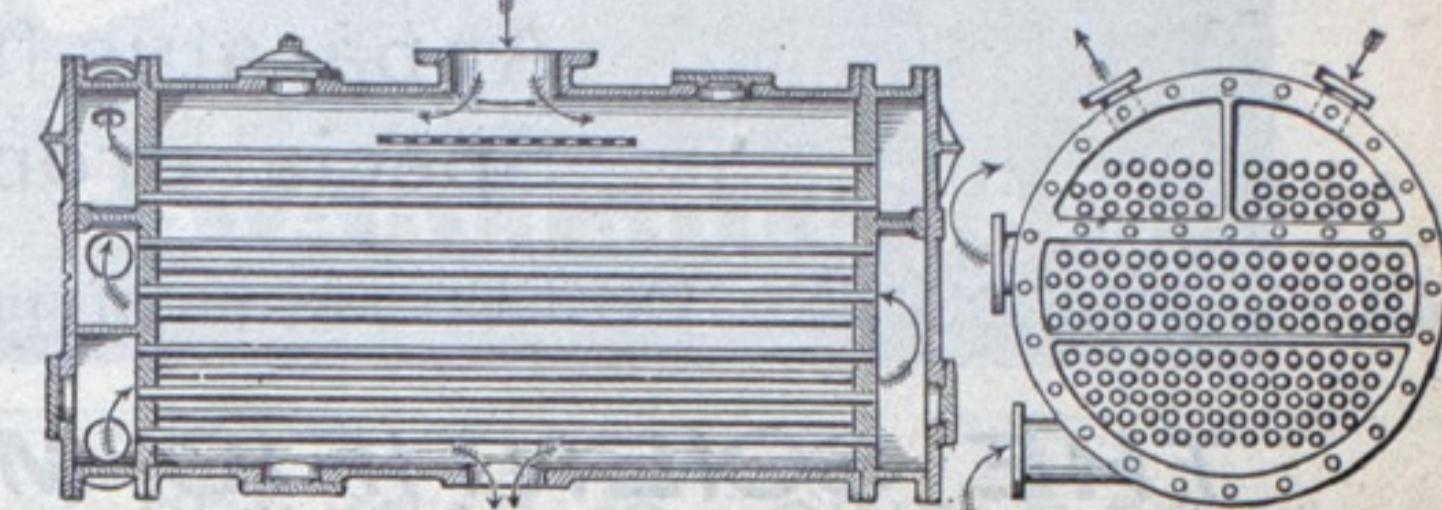
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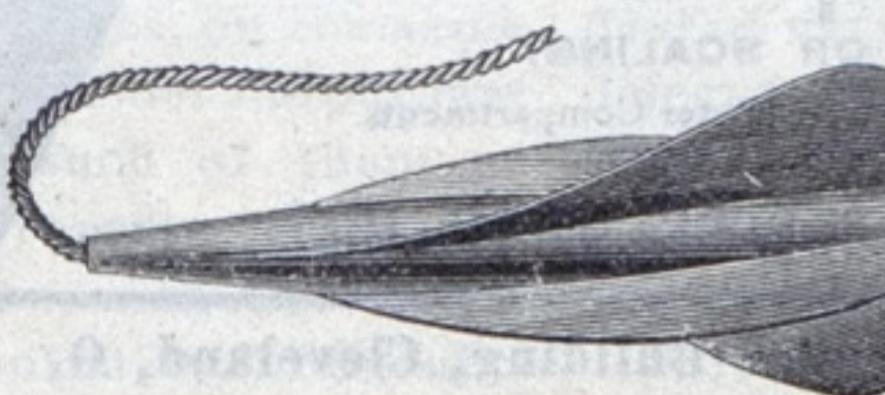
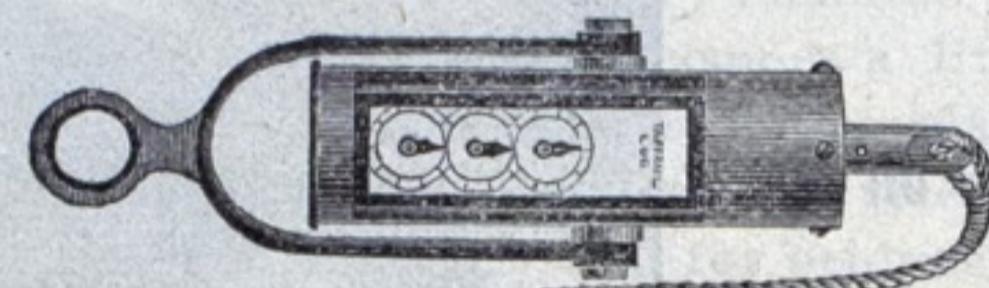
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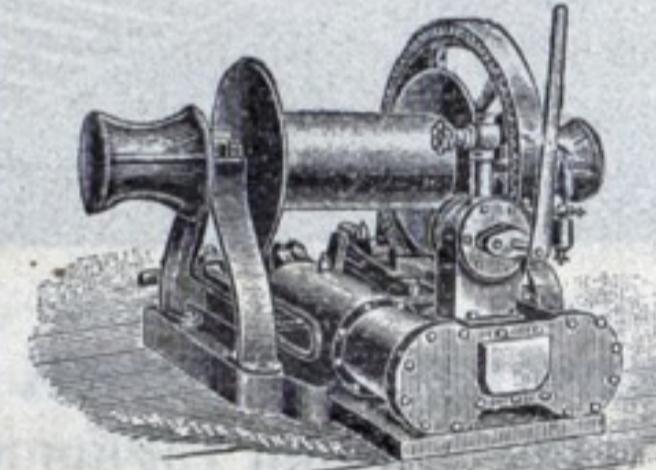
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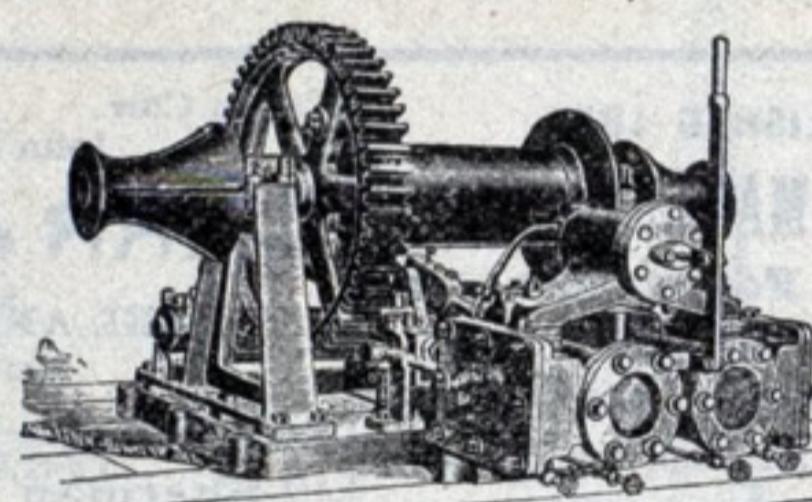


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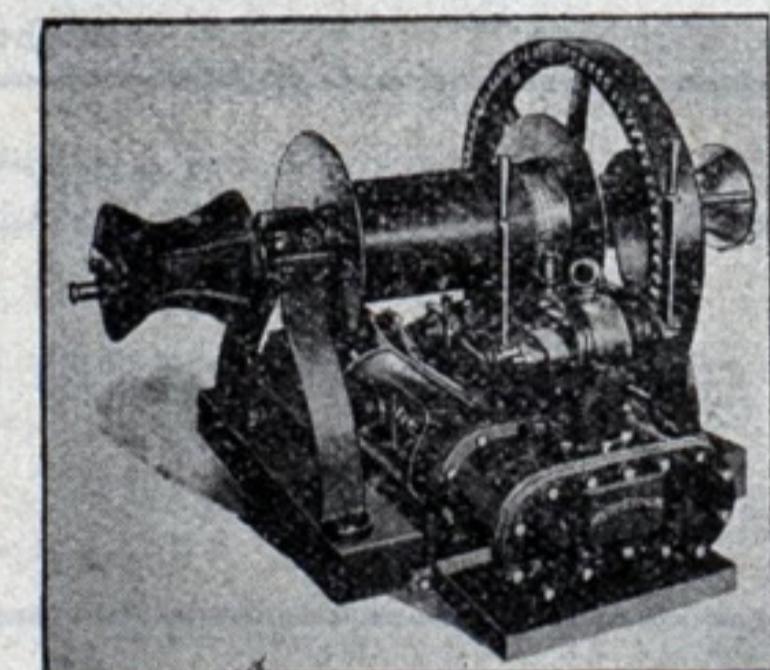
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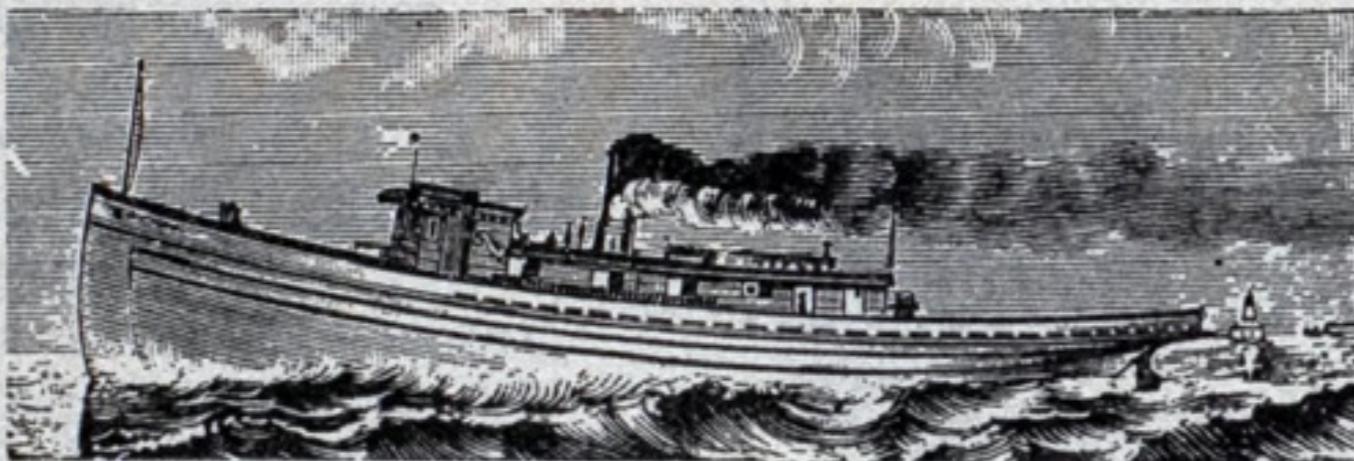
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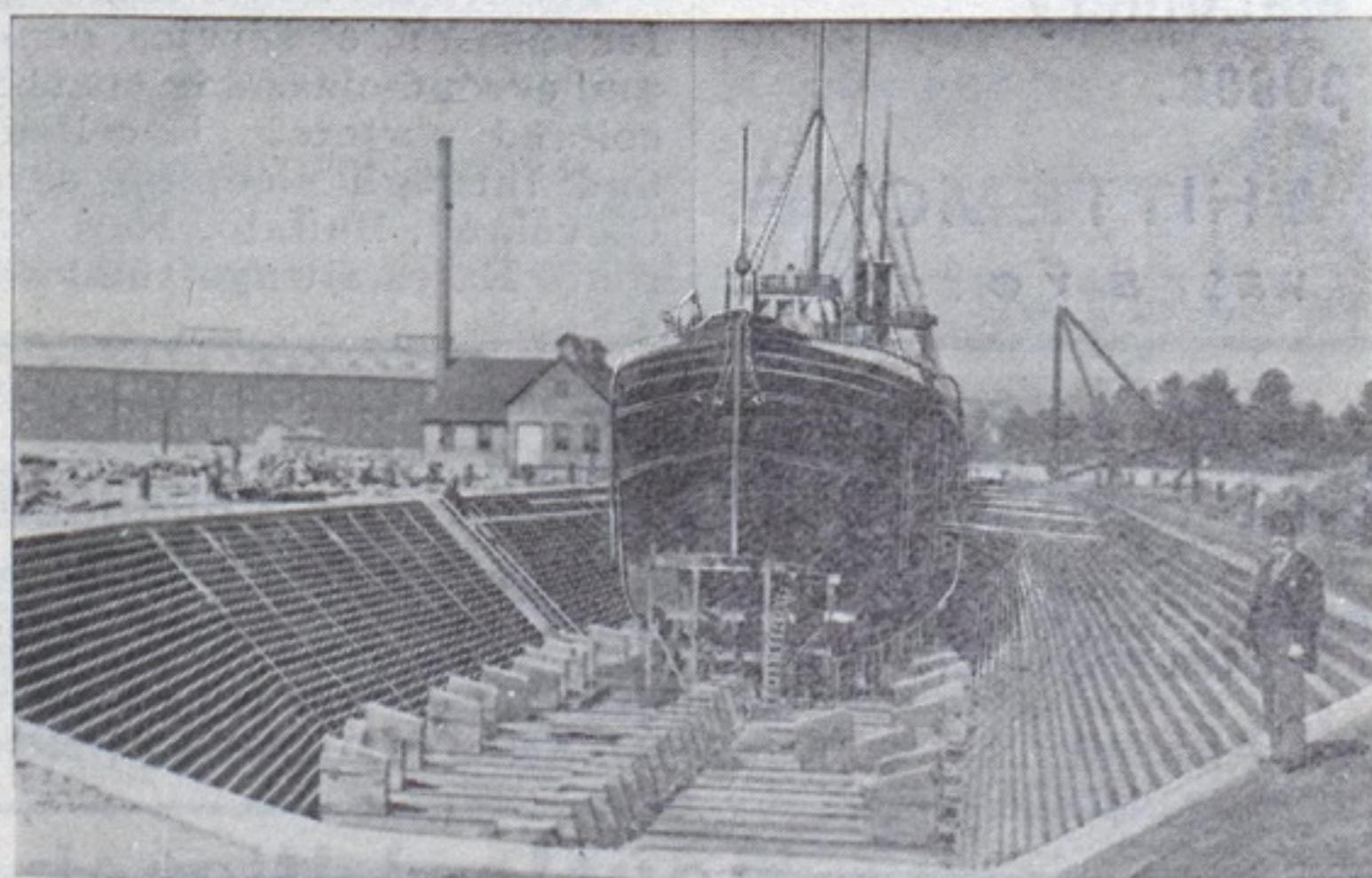
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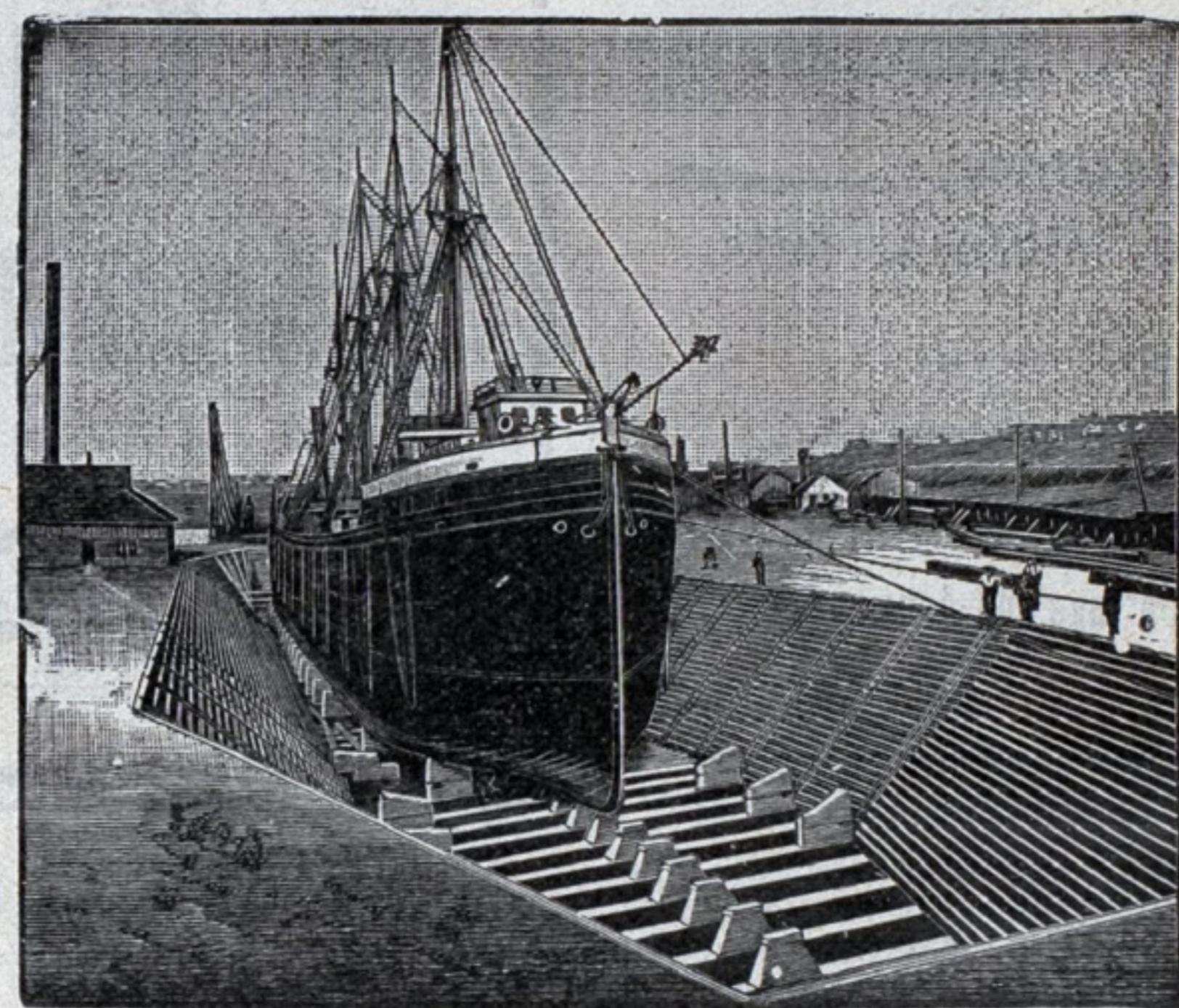
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